DÜRKOPP ADLER

650-16 Operating Instructions

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1 About this operating instructions

This operating instructions for sewing machine 650-16 was compiled with the utmost care. It contains information and notes to enable the machine to give many years of reliable service.

Please contact us if you find any discrepancies or have any suggestions, 📖 *5.11 Customer Service*, page 38.

Consider this operating instructions part of the product and keep it on hand at all times. Be sure to read the manual completely before using the product for the first time. If you pass the product on to someone else, please be sure to give them the operating instructions.

1.1 Scope

This operating instructions describes the set-up and intended use of the 650-16 sewing machine.

1.2 For whom is this operating instructions intended?

This operating instructions is intended for:

- Operators:
  This group is familiar with the machine and has access to the operating instructions. Specifically, 📖 *5 Operation*, page 25 is important for this group.
- Technicians:
  This group has the appropriate technical training for performing maintenance on the sewing machine or repairing malfunctions. Specifically, 📖 *6 Installation*, page 39 is intended for technical personnel.
  A service manual will be provided separately.

With regard to minimum qualifications and other requirements to be met by the personnel, please also observe 📖 *3 Safety instructions*, page 17.

1.3 Representation conventions – symbols and characters

Various information in this operating instructions is represented or highlighted by the following characters in order to facilitate easy and quick understanding:

Correct setting

Indicates proper setting.

Malfunctions

Specifies the faults that can occur due to an incorrect setting.

Steps to be performed when operating the machine (sewing and setting up)

Steps to be performed for servicing, maintenance, and installation

Steps to be performed via the software control panel

The individual steps are numbered:

1. 1. First step
2. 2. Second step

... The sequence of the steps must always be followed.

- Lists are identified by bullet points.

Result of performing an operation

Change to the machine or in the display.

Important

Special attention must be paid to this point when performing a step.

Information

Additional information, e.g. on alternative operating options.

Order

Specifies the work to be performed before or after a setting.

References

📖 Reference to another section in the manual.

Safety Important warnings for the machine operator are specially designated. Since safety is of particular importance, hazard symbols, levels of danger and their signal words are described separately in 📖 *3 Safety instructions*, page 17.

Orientation If the figure is unclear, indications of “right” and “left” are always from the operator's point of view.

1.4 Other documents

This equipment includes components from other manufacturers. Each manufacturer has performed a hazard assessment for these purchased parts and confirmed their design compliance with applicable European and national regulations. The proper use of these components is described in each manufacturer's manual.

1.5 Liability

All information in this operating instructions was compiled with consideration to the state of the art, and applicable standards and regulations.

The manufacturer cannot be held liable for damages resulting from:

- Breakage and transport damages
- Failure to observe operating instructions
- Improper use
- Unauthorized modifications to the machine
- Use of untrained personnel
- Use of unapproved replacement parts

1.5.1 Transport

Dürkopp Adler cannot be held liable for breakage and transport damages. Inspect the delivery immediately upon receiving it. Report any damage to the last transport manager. This applies even if the packaging is undamaged.

Leave machines, equipment and packaging material in the condition in which they were found when the damage was discovered. This will ensure any claims against the transport company.

Report all other complains to Dürkopp Adler immediately after receiving the product.

1.5.2 Proper use

The Dürkopp Adler 650-16 is intended for sewing light to moderately heavy material. Light to moderately heavy material requires a needle strength of 70-120 Nm.

The machine is intended only for use with dry material. The material must not contain any hard objects.

The stitching is produced using core spun threads, polyester fibers, or cotton threads.

The sewing machine is intended for industrial use.

The machine may only be set up and operated in dry conditions on well-maintained premises. If the machine is operated on premises that are not dry and well-maintained, then further measures may be required which must be compatible with EN 60204-31: 1999.

Only authorized/trained personnel may operate the machine.

The manufacturer cannot be held liable for damages resulting from improper use.

WARNING

Risk of electric shock, crushing and pointed objects!
Improper use can result in injury.
Please observe all instructions in the manual.

ATTENTION

Improper use can result in material damage.
Please observe all instructions in the manual.

2 Technical Specifications

The Dürkopp Adler 650-16 is a special sewing machine for programmed or manual sewing in of sleeves in ladies' and mens' outerwear.

2.1 Characteristics

The sewing machine is equipped with an integral sewing head drive, with a stepper motor which drives upper and lower belt transport for gentle transport of the material, together with stepper motor-driven curve support and an inclined base of improved material handling.

The presser foot is powered by a stepper motor and the electromagnetically controlled needle thread tension permit programming of these parameters.

For the operation of the machine either the OP3000 control panel or the OP7000 control panel must be selected.

The OP3000 control panel with graphical display permits easy creation of programs and improved overview of the parameter settings and the programmed seam.

The OP7000 control panel with touch screen displays the contour to be sewn graphically and in color. In this mode the graduating function is available. On the basis of a programmed size this creates other sizes automatically and optimizes the programming of further sizes by graduating the program. Programs can be saved to a USB stick and transferred to other machines.

The optional, ergonomically shaped table top provides additional assistance to working.

The further features are:

- Single-needle integral column machine
- Integral sewing head drive in the housing
- Number of stitches max. 4000 rpm
- Machine without lubrication
- Integral LED sewing light
- Oil-free horizontal hook
- Stitch length from 1.0 to 5.5 mm adjustable and programmable in 0.1 mm steps
- Presser foot pressure electronically controlled and programmable

- Alternating belt upper transport (programmable), allowing easy passage of the material past the needle. Maximum alternation height 2.5 mm (depending on the speed)
- Electronically regulated thread tension (programmable), for different materials and for heavy gathering
- Patented curve support for easy material handling (programmable)
- Electromagnetic thread cutter
- Automatic bartack
- Raising the presser foot: 12 mm
- Built-in adjusting disc with positioning marks on the handwheel for quick checking of the machine setting.
- Edge stop stepping width from 7.5 mm
- OP3000 button bar with graphics display
  - Within reach of the operator
  - Gathering values between - 6 and 16, i.e. a maximum of 23 available gathering values.
  - Graphics display allows easy creation of programs by teaching, editing, copying and deletion
  - Direct input of the gathering value by correction in automatic mode or in manual mode.
- OP7000 control panel
  - 5.7” touch screen with 16-bit color depth
  - USB connection type A (use only a USB stick with the part number 9805 791113)
  - the same scope of functionality as for OP3000
  - the additional graduation function for automatic adaptation of the program to different sizes
  - graphical representation of the segments of the armhole with concurrent progress display
- Optional second pedal

  When the pedal is pushed forwards the fullness for a step is increased by one gathering value; when it is pushed backwards it is decreased.

  When the next step is called up the gathering value specified in the program applies once again. Alternatively, depending on the setting in the technician level the curve radius altered in the same way.

2.2 Declaration of conformity

The machine complies with the European regulations specified in the declaration of conformity or in the installation declaration.

CE

2.3 Additional equipment

A flexible system of additional equipment allows the sewing machine to be optimally equipped for any application at low cost.

● = Standard equipment

O = Optional enhancement

Order number	Additional equipment	650-16
0650 E00001	Equipment for normal material	O
0650 491054	OP3000 - button bar	O
0650 491074	OP7000 - control panel	O
9805 791113	USB stick (only for OP7000)	O
9822 510003	Halogen sewing light for machine upper part	O
0798 500088	Transformer for sewing light	O
MG55 400504	Frame MG 55-3 and table top 1320x750	O
0650 400014	Additional pedal set for altering the fullness and curve radius	O
MG55 007914	Rollers retrofit set	O
9880 650003	Attachment set for sewing light	O
0650 590014	Initial set of spare parts	O

Order number	Additional equipment	650-16
0791 650400	Set of seam templates (for demonstration purposes)	O
0650 E00002	Equipment for heavy material	O

2.4 Technical data

Noise levels

Workplace-specific emission value as per DIN EN ISO 10821:

L_C = 79 dB (A) ± 0.83 dB(A) at

- Stitch length: 3.0 mm
- Number of stitches: 2900 rpm
- Material: 2-layer material G1 DIN 23328

Technical data	650-16
Stitch type	Double top-stitching 301
Hook type	Horizontal hook, oil-free
Number of needles	1
Needle system	134-35
Needle thickness [Nm]	70 – 120
Sewing thread thickness [Nm]	max. 50 / 3
Stitch length (programmable) [mm]	1.0 – 4.0
Number of stitches (programmable) [stitches/min]	max. 4000
Bartack sewing (programmable)	Start bartack/ end bartack
Clearance under the raised presser foot [mm]	max. 12
Sewed material thickness [mm]	max. 4

Technical data	650-16
Table height (steplessly adjustable) [mm]	780 – 900
Width, height, depth [mm] (machine installed on the frame)	1320/1300/750
Weight [kg] (machine installed on the frame)	115
Rated voltage [V/Hz]	190 – 240V 50/60Hz
Rated voltage on delivery [V/Hz]	1 x 230V 50Hz
Rated power [kVA]	1.0

3 Safety instructions

This section contains basic information for your safety. Read the instructions carefully before setting up or operating the machine. Make sure to follow the information included in this section. Failure to do so can result in serious injury and damage to the machine.

3.1 Basic safety instructions

The machine may be used only as described in this operating instructions.

The operating instructions should be available at the machine's location at all times.

Work on live components and equipment is prohibited. Exceptions are defined in the specifications in DIN VDE 0105.

For the following work, the machine must be disconnected from the power supply using the main switch or by disconnecting the power plug:

- Replacing the needle or other sewing tools
- Leaving the workplace
- Performing maintenance work and repairs
- Threading

Missing or faulty spare parts could impair safety and damage the machine. Make sure you only use original replacement parts from the manufacturer.

Transport Use a sturdy lifting carriage or forklift for transporting the machine. Raise the machine max. 20 mm and secure it against slipping off.

Installation

The power cable must have a plug authorized for the country in which the machine is being used. The power plug may only be connected to the power cable by a qualified specialist.

Obligations of the operator

Observe the country specific safety and accident prevention regulations and the legal regulations concerning industrial safety and the protection of the environment.

All warnings and safety signs on the machine must always be in legible condition and may not be removed. Missing or damaged labels should be replaced immediately.

Requirements to be met by the personnel

The machine should only be set up by qualified technicians.

Maintenance work and repairs should only be carried out by qualified technicians.

Work on electrical equipment may only be carried out by qualified specialists.

Only authorized persons may work on the machine. Every person who works on the machine must first have understood the operating instructions.

Operation

Inspect the machine while in use for any externally visible damage. Stop working if you notice any changes to the machine. Report any changes to your supervisor. A damaged machine should no longer be used.

Safety equipment

Safety equipment should not be removed or deactivated. If this cannot be avoided for a repair operation, the safety equipment must be refitted and put back into service immediately afterwards.

3.2 Signal words and symbols used in warnings

Warnings in the text are distinguished by color bars. The color scheme is oriented towards the severity of the danger. Signal words indicate the degree of risk:

Signal words Signal words and the hazard that they describe:

Signal word	Hazard
DANGER	Will result in serious injury or death.
WARNING	Can result in serious injury or death.
CAUTION	Can result in minor or moderate injury.
ATTENTION	Can result in property damage.

Symbols The following symbols indicate the type of risk to personnel:

Symbol	Type of danger
	General risk
	Risk of electric shock
	Risk of puncturing
	Risk of crushing

Examples Examples of the layout of the warnings in the text:

DANGER

Type and source of risk
Consequences of non-observance
Measures for avoiding the risk
This is what a warning looks like for a hazard that will result in serious injury or even death if ignored.

WARNING

Type and source of risk
Consequences of non-observance
Measures for avoiding the risk
This is what a warning looks like for a hazard that could result in serious injury or even death if ignored.

CAUTION

Type and source of risk
Consequences of non-observance
Measures for avoiding the risk
This is what a warning looks like for a hazard that could result in moderate or minor injury if the warning is ignored.

ATTENTION

Type and source of risk
Consequences of non-observance
Measures for avoiding the risk
This is what a warning looks like for a hazard that could result in material damage if ignored.

CAUTION

Type and source of risk
Consequences of non-observance
Measures for avoiding the risk
This is a warning note for a hazard that could result in environmental damage if ignored.

4 Machine Description

Figure 1: General view of the 650 sewing machine

(1) - Machine upper section
(2) - Thread reel holder
(3) - Foot pedal
(4) - Main switch

5 Operation

5.1 Threading the needle

WARNING

Risk of injury from the point of the needle and moving parts
Turn off the sewing machine before threading the thread.

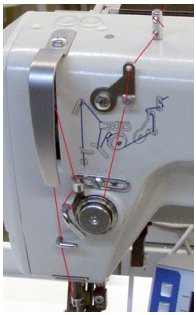
Steps

1. Plug the thread reels on to the thread reel holders and feed the needle and hook threads through the unwinding bracket.

   Important: The unwinding bracket must be horizontal and be positioned above the thread reels.

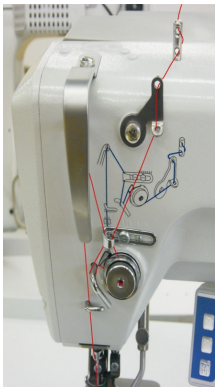
2. Thread the needle thread as shown in the following figure.

Figure 2: Threading the needle



Threads with high elasticity

Figure 3: Threading the needle with threads of high elasticity



5.2 Setting the needle thread tension

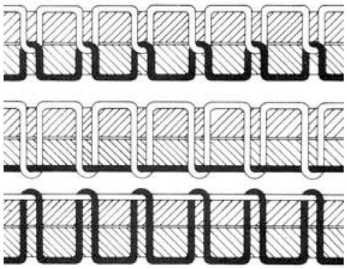
Correct setting

The main tension (1) should be set as low as possible.

The thread interlacing should be exactly in the middle of the material being sewn.

With thin sewn material, excessive thread tension can lead to undesired gathering and thread breakages.

Figure 4: Interlacing

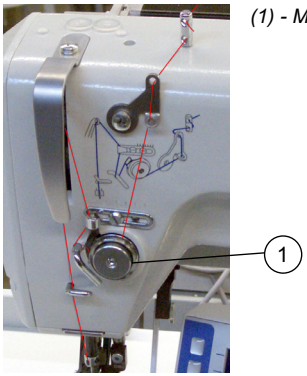


Correct thread interlacing in the middle of the material being sewn

Needle thread tension too weak or hook thread tension too strong

Needle thread tension too strong or hook thread tension too weak

Figure 5: Main tensioner



(1) - Main tensioner

Steps

1. Set the main tensioner (1) via the control panel so that a even stitch pattern is achieved.

Opening automatic

When the thread is cut, the main tensioner (1) is opened automatically.

5.3 Setting the thread regulator

WARNING

Risk of crushing by moving parts
Switch the sewing machine off before setting the thread regulator.

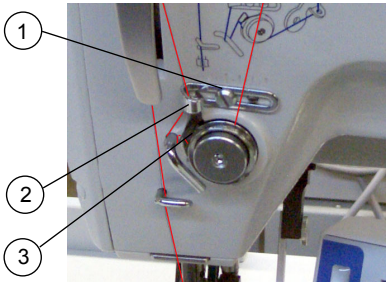
The thread regulator regulates the amount of needle thread required for forming the stitch. An optimum sewing result is possible only when the thread regulator is exactly adjusted.

Correct setting

With the correct setting the needle thread loop must slide over the thickest part of the hook at low tension.

When the largest thread quantity is required then the thread tension spring (3) must be pulled approx. 0.5 mm down from its upper end position. This occurs when the needle thread loop matches the maximum hook diameter.

Figure 6: Setting the thread regulator



(1) - Screw
(2) - Thread regulator
(3) - Thread tensioning spring

Steps

1. Loosen the screw (1).
2. Change the setting of the thread regulator (2).
3. Tighten the screw (1).

5.4 Winding the hook thread

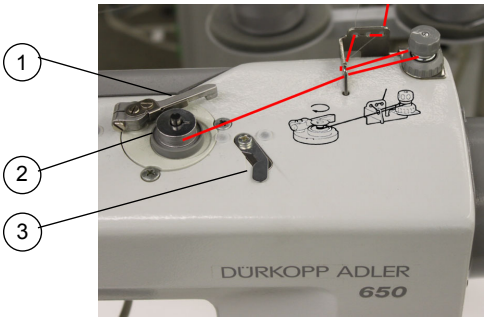
ATTENTION

Possible machine damage through moving the bobbin without performing sewing

Moving the bobbin without performing sewing can cause damage to the presser foot and the bobbin case in the hook.

Activate bobbin mode if you wish to wind the hook thread without performing sewing.

Figure 7: Winding the hook thread



(1) - Winder flap
(2) - Bobbin
(3) - Cutter

Steps

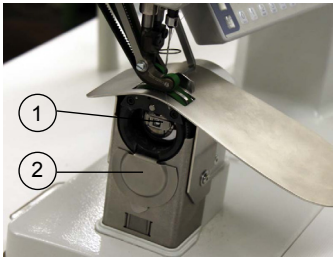
1. Fit the bobbin (2) on the bobbin shaft.
2. Thread the hook thread as shown in the following figure.
3. Wind the hook thread clockwise on to the bobbin core.
4. Swing the bobbin winder flap (1) against the bobbin.
5. Switch the main switch on.
6. Start sewing.
7. Once the bobbin is full, the winder switches off automatically (📖 *Service manual section 16.1*).
8. Pull off the bobbin, clamp the thread under the cutter (3) and tear it off.

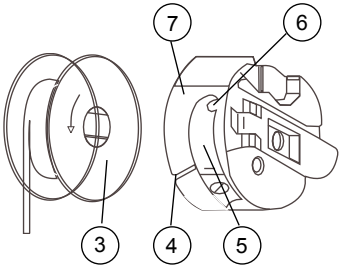
5.5 Replacing the hook thread bobbin

WARNING

Risk of injury from moving parts
Switch off the sewing machine before replacing the hook thread bobbin.

Figure 8: Replacing the hook thread bobbin





(1) - Bobbin housing flap
(2) - Hook cover
(3) - Bobbin
(4) - Slot
(5) - Tension spring
(6) - Hole
(7) - Bobbin housing upper section

Steps

Removing an empty bobbin

1. Push the hook cover (2) downwards.
2. Move the needle to the up position.
3. Lift the bobbin housing flap (1).
4. Remove the bobbin housing upper section (7) with the bobbin (3).
5. Remove the empty bobbin (3) from the bobbin housing upper section (7).

Inserting a full bobbin

1. Insert the full bobbin (3) into the bobbin housing upper section (7).
2. Feed the hook thread through the slot (4) under the tensioning spring (5) into the hole (6).
3. Pull the hook thread approx. 5 cm out of the bobbin housing (7).
4. The bobbin must rotate in the direction of the arrow when pulling out the thread.
5. Insert the bobbin housing (7) again.
6. Push the hook cover (2) upwards.

5.6 Setting the hook thread tension

WARNING

Risk of injury from moving parts
Switch off the sewing machine before replacing the hook thread bobbin.

Correct setting

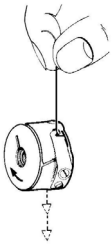
The hook thread tension must be set so that the resulting stitch pattern looks like the figure in 📖 *5.2 Setting the needle thread tension*, page 26.

At the recommended hook thread tension of e.g. 25 g (measured with a full bobbin), 12.5 g should be generated by the braking spring and 12.5 g by the tensioning spring.

The basic setting for the tensioning spring is performed as follows:

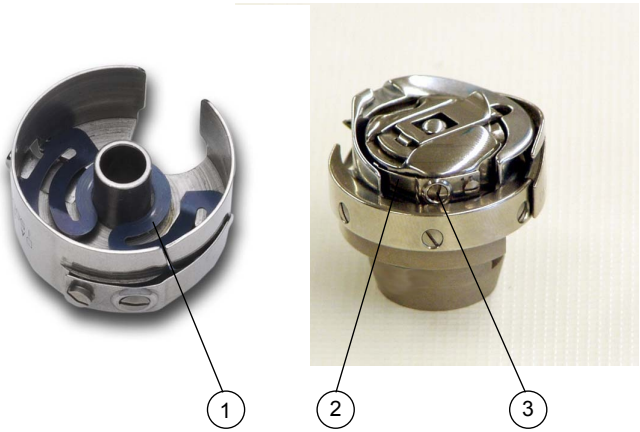
When the bobbin housing contains a full bobbin it must sink slowly under its own weight.

Figure 9: Bobbin housing sinking



The braking spring prevents the bobbin running on when the thread has been cut.

Figure 10: Setting the hook thread tension



(1) - Braking spring
(2) - Tension spring
(3) - Regulating screw

Steps

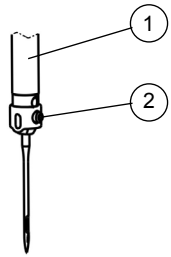
1. Turn back the adjusting screw (3) so far that the tension on the tensioning spring (2) is completely removed.
2. Bend the braking spring (1) such that half the recommended hook thread tension value is applied through the braking spring.
3. Insert the bobbin into the bobbin housing upper section and thread in the hook thread 📖 *5.4 Winding the hook thread*, page 28.
4. Insert the bobbin housing together with the bobbin into the hook.
5. Hold the free thread end tightly with one hand.
6. Turn the handwheel until the sewing machine performs one stitch.
7. Pull the hook thread on to the upper side of the needle hole using the needle thread.
8. Remove the hook thread in the direction of sewing at an angle of 45°. About half the tension value should be evident.
9. Then tighten the adjusting screw (3) up to the recommended tension value.

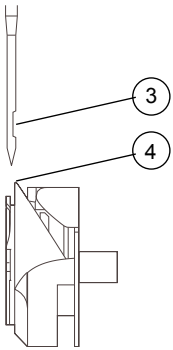
5.7 Changing the needle

WARNING

Risk of injury from the point of the needle and moving parts
Turn the sewing machine off before replacing the needle.

Figure 11: Changing the needle





(1) - Needle bar
(2) - Screw
(3) - Groove
(4) - Hook tip

Steps

1. Loosen the screw (2) and remove the needle.
2. Insert the new needle into the hole in the needle bar (1) until it reaches the end stop.
   Important: The groove (3) must face towards the hook tip (4).
3. Tighten the screw (2).

Order

After changing to a different needle thickness, always adjust the clearance between the hook and the needle
(📖 *Service manual section 6.1*).

Malfunctions

An incorrect hook distance can cause the following malfunctions:

- Changing to a thinner needle: Missing stitches
  Thread damage
- Changing to a thicker needle: Damage to the hook tip
  Damage to the needle

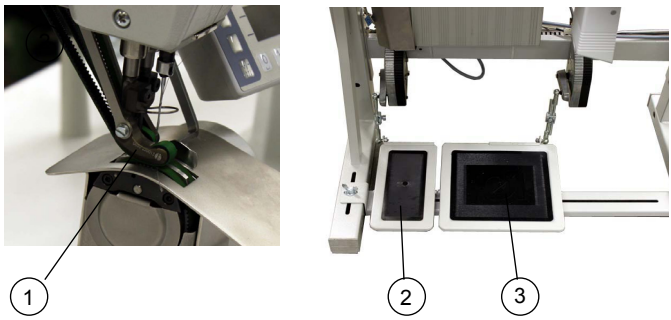
5.8 Raising the presser feet

WARNING

Risk of crushing by the presser feet
Do not reach under the raised presser feet.

The presser feet (1) can be raised by an electric motor, by depressing the pedal (3).

Figure 12: Raising the presser feet



(1) - Presser feet
(2) - Additional pedal (optional)
(3) - Foot pedal

Steps

1. Push the pedal halfway backwards.
2. Raise the presser feet.

   or

1. Push the pedal fully backwards.
2. Activate the thread cut-off and raise the presser feet.

5.8.1 Functions of the optional additional pedal

The left pedal (2) has a dual function. Depending on the setting of the technician level it either alters the fullness or the curve support (📖 *Service manual section 17.3.3*).

- In automatic mode:
  The value for fullness or curve support is corrected for the current step.
- In manual mode:
  The value for fullness or curve support is selected.

Steps

1. Depress the additional pedal:
   - Push the pedal forwards: Increase the value
   - Push the pedal backwards: Decrease the value

5.9 Knee switch

The knee switch (1) is used to switch the seam programs from one step to the next, both in automatic mode and also in programming mode.

Figure 13: Knee switch

(1) - Knee switch

Steps

1. Depress the knee switch.

↳ The next step is called up.

5.10 Sewing

Before starting sewing	
Initial situation	• Pedal is in the rest position. ↳ Sewing machine is at a standstill. ↳ Needle is up. Presser foot is down.
Position material at the start of the seam	• Push the pedal half backwards. ↳ The presser foot rises. • Position the sewing material. • Release the pedal. ↳ The presser foot descends on to the sewing material.
At the start of the seam	
Starting bartack and sewing the seam	• Push the pedal forwards and keep it there. ↳ Starting bartack is sewn (if specified). Then the machine sews along the seam at the speed determined by the pedal.
In the middle of the seam	
Stopping sewing	• Release the pedal (position 0). ↳ The machine stops in the 1st position (needle down) or in the needle up position (depending on the setting chosen). The presser foot is down or raised (depending on the setting chosen).
Continue sewing (after releasing the pedal)	• Press the pedal forwards. ↳ The machine continues to sew at the specified speed.
Intermediate raising	• Push the pedal half backwards. ↳ The presser feet are raised. • Correct the material. • Release the pedal. ↳ The presser feet are lowered.
Altering the fullness	• Press the fullness button or the left pedal. ↳ The selected fullness value is activated.
At the end of the seam	

Remove the material to be sewn	• Push the pedal fully backwards and keep it there. ↳ The end bartack is sewn (if activated). ↳ The thread is cut off (if activated). ↳ The machine stops in the 2nd position. ↳ The needle is up. The presser feet are raised. • Remove the sewn material. • Release the pedal. ↳ The presser feet are lowered.

5.11 Customer Service

Contact for repairs if machine is damaged:

Dürkopp Adler AG
Potsdamer Str. 190
33719 Bielefeld, Germany

Tel. +49 (0) 180 5 383 756
Fax +49 (0) 521 925 2594
E-mail: service@duerkopp-adler.com
Internet: www.duerkopp-adler.com

6 Installation

WARNING

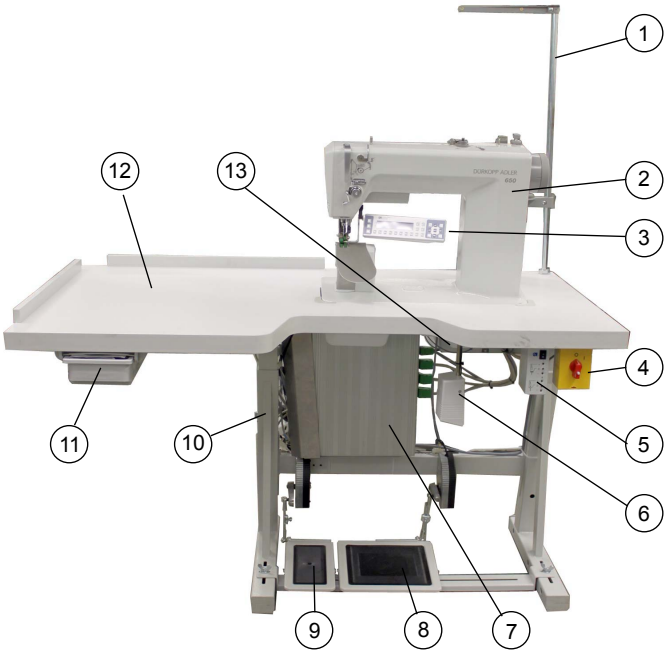
Risk of injury
The machine may be installed only by trained specialists.
Wear safety gloves and safety shoes when unpacking and installing.

6.1 Scope of delivery

The scope of delivery depends on your specific order.

Check that all parts required are present before installing the machine.

Figure 14: Scope of delivery



This description applies to a special sewing machine whose individual components are all supplied by Dürkopp Adler:

- Upper part of the machine, including the LED sewing light (2)
- Control panel (optional) (3)

Dürkopp Adler accessory pack with:

- Thread reel holders (1)
- Main switch (4)
- Transformer for the LED sewing light (5)
- Protective cover (not illustrated)
- Fastening material
- Knee switch (6)

Controller parts set, complete:

- DAC 3 controller (7)
- Additional controller (13)

Additional equipment:

- Support frame (10) with table (12), drawer (11), rodding and pedal (8)
- Additional pedal and rodding (9)

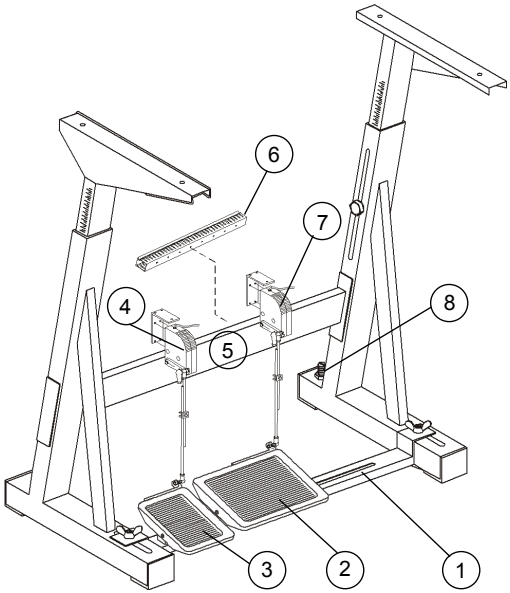
6.2 Removing the transport locks

When you have installed the special sewing machine which you bought, you must remove the following transport locks:

- Lashing straps and wooden blocks from the upper part of the machine, the table and the support frame
- Restrain block and lashing straps from the sewing head

6.3 Assembling the frame

Figure 15: Assembling the frame



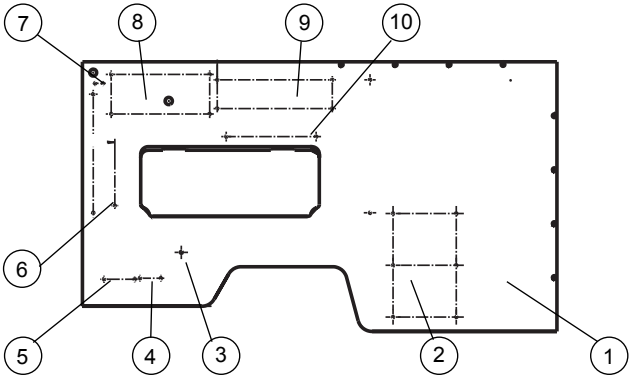
(1) - Cross strut
(2) - Main pedal
(3) - Additional pedal
(4) - Setpoint transducer for the additional pedal
(5) - Frame brace
(6) - Cable duct
(7) - Setpoint transducer for the main pedal
(8) - Adjusting screw

Steps

1. Attach the pedal (2) to the cross brace (1).
2. Attach the additional pedal (3) (optional) to the cross brace (1).
3. Attach the cross brace (1) to the frame.
4. After the machine has been fully assembled, align the pedals, *6.5 Attaching the table top and pedals to the frame*, page 43.
5. Screw the setpoint transducers (4) and (7) on to the frame brace (5). Distance between the floor and the upper edge of the frame brace (5): 290 mm.
6. Screw the cable duct (6) (30 x 30 x 250 mm) for the setpoint transducer cables on to the frame brace (5).
7. Turn the adjusting screw (8) to ensure that the frame stands securely. The frame must stand with all four feet on the floor.

6.4 Pre-assembling the table top

Figure 16: Pre-assembling the table top



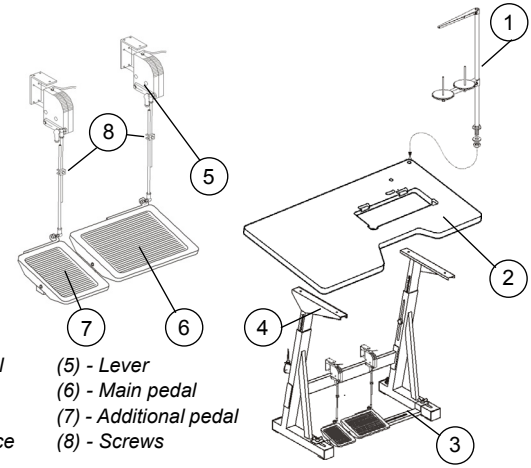
Steps

1. Use the table top (1).
2. Screw on the drawer (2) and its brackets (chipboard screws 3.5 x 17).
3. Screw on the knee switch (3).
4. Screw on the sewing light transformer (4).
5. Screw on the main switch (5) (chipboard screws 5 x 30).
6. Screw on the cable duct (6) (40 x 40 x 200 mm long) (chipboard screws 3.5 x 17).
7. Screw on the strain relief (7) (chipboard screws 3.5 x 17).
8. Screw on the additional controller (8) (chipboard screws 5 x 30).
9. Screw on the DAC motor controller incl. protective plate (9) (chipboard screws 5 x 30).
10. Screw on the cable duct (40 x 40 x 250 mm long) (10) (chipboard screws 3.5 x 17).
11. Fit the electric cables, 📖 *6.9 Electrical connection*, page 47.

Larger scale diagrams can be found at the end of the manual, 📖 *10 Appendix*, page 127.

6.5 Attaching the table top and pedals to the frame

Figure 17: Attaching the table top and aligning the pedals



(1) - Thread reel holder
(2) - Table top
(3) - Frame brace
(4) - Frame
(5) - Lever
(6) - Main pedal
(7) - Additional pedal
(8) - Screws

Steps

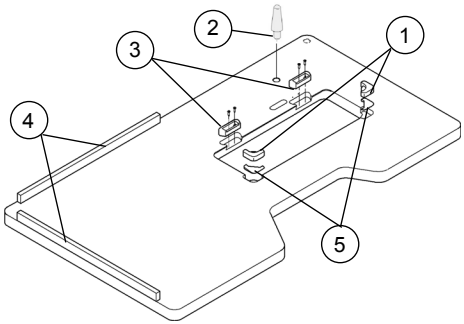
1. Using wood screws (6 x 30), attach the frame (4) to the table top (2). Drill pilot holes for the wood screws.
2. Use the center marks to position the pilot holes.
3. Turn the frame (4) the right way up.
4. Align the pedals.
5. For ergonomic reasons, align the pedals laterally so that the center of the main pedal (6) is directly beneath the needle.

   The frame brace (3) is provided with slotted holes to allow alignment of the pedal.
6. Loosen the screws (8).
7. Adjust the height of the pedal rodding so that in the home position the pedal slope is about 10°.
   The lever (5) on the setpoint transducer can be adjusted to suit.
8. Tighten the screws (8).
9. Insert the thread reel holder (1) into the hole in the table top, and secure it with a nut and washer.
10. Fit and align the thread reel holders and unwinding bracket.

Important: The unwinding bracket must be vertically above the thread reel holders.

6.6 Completing the table top

Figure 18: Completing the table top



(1) - Rubber corners
(2) - Upper part support
(3) - Hinge mountings
(4) - Edge strips
(5) - Oblique fittings

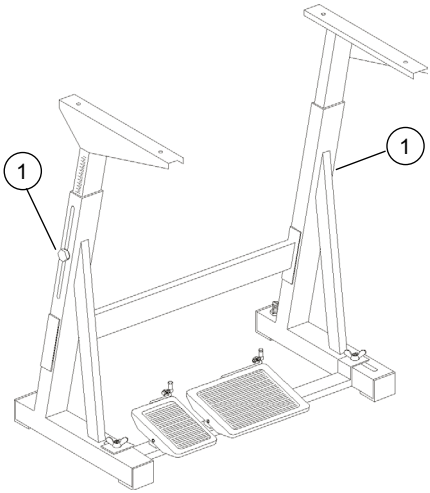
Steps

1. Insert the oblique fittings (5).
2. Insert the rubber corners (1) into the table top.
3. Using 4.5 x 15 (4x) screws, screw on the hinge mountings (3).
4. Using 4.5 x 55 (8x) screws, screw the edge strips (4) to the table top.
5. Insert the upper part support (2).

6.7 Setting the working height

The working height can be adjusted between 780 and 900 mm (measured to the upper edge of the table plate).

Figure 19: Setting the working height



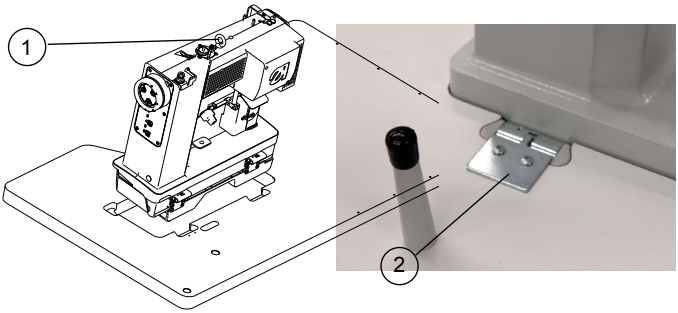
(1) - Screws

Steps

1. Slacken the screws (1) on the frame bars.
2. Set the table top to the desired working height.
3. To avoid jamming, slide the table top in or out evenly at both sides.
4. Tighten the screws (1).

6.8 Inserting the machine upper part

Figure 20: Inserting the machine upper part



(1) - Transport eye

(2) - Clamping plate

Steps

1. Using the transport eye (1), lift the machine upper part and insert it into the cut-out on the table top.
2. After the upper part has been placed in position, immediately connect the bracket (2) which prevents the upper part coming loose if the table top is tipped.

The bracket is included in the accessories pack for the upper part.

If the machine is supplied ready assembled, the transport eye is included in the accessories pack.

WARNING

Risk of injury due to the upper part tipping
When transporting the machine, secure the upper part against tipping.

6.9 Electrical connection

DANGER

Danger of life-threatening electric shock
The machine may be connected only by trained electricians.
Disconnect the power plug before starting to work on the electrical equipment.
Make sure the machine cannot be accidentally switched back on.

6.9.1 Checking the mains voltage

The voltage on the type plate of the sewing drive must correspond to the mains voltage.

DANGER

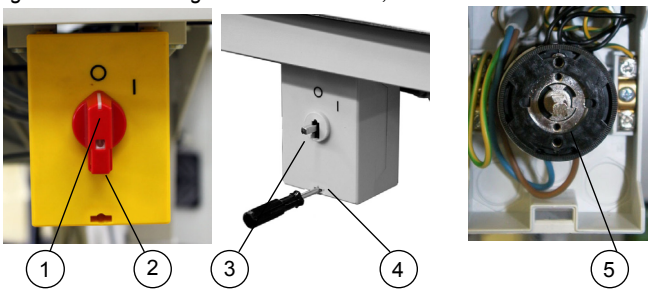
Danger of life-threatening electric shock
Make sure that the voltage listed on the type plate of the sewing drive corresponds to the mains supply voltage.

6.9.2 Connecting the mains power supply

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before connecting the mains power supply to the main switch.
Make sure the machine cannot be accidentally switched back on.

Figure 21: Connecting the control cabinet, additional controller and LED transformer



(1) - Switch knob
(2) - Screw
(3) - Bracket
(4) - Hole
(5) - Switch

Steps

1. Undo the screw (2) in the knob and take off the switch knob (1).
2. Remove the cover (3) from the main switch. Unlock this, using a screwdriver to push the bar out of the hole (4).
3. Lay the cables for the control cabinet, the additional controller and the LED transformer in cable duct.
4. Insert the cables into the main switch.
5. Connect the cable cores from the control cabinet to the screw terminals “T1” and “T2” on the switch (5).
6. In addition, connect the additional controller to the screw terminals “T1” and “T2”.
7. Connect the LED transformer leads to “L1” and “L2” (in addition to the mains supply cable).
8. Connect the protective earth conductors of the control cabinet and the additional controller to the main switch.

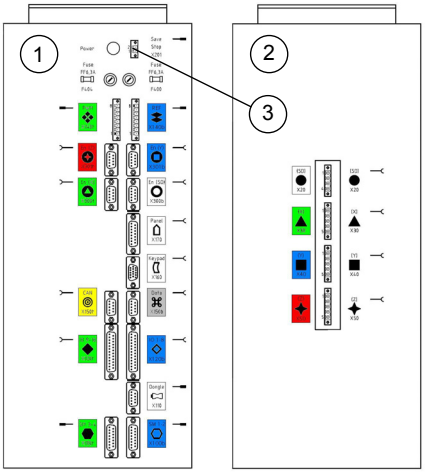
9. Replace the cover (3) on the main switch.
10. Fit the switch knob (1) and screw it tight.
11. Place the cable duct cover on the cable duct.

6.9.3 Connecting the cables to the upper part

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before connecting the cables to the upper part.
Make sure the machine cannot be accidentally switched back on.

Figure 22: Connecting the cables to the upper part



(1) - Connections, side 1
(2) - Connections, side 2
(3) - Bridge plug 9850 001208

All cables are color coded.

Important: The bridge plug 9850 001208 (3) must be plugged into the controller, otherwise the controller will not work.

Steps

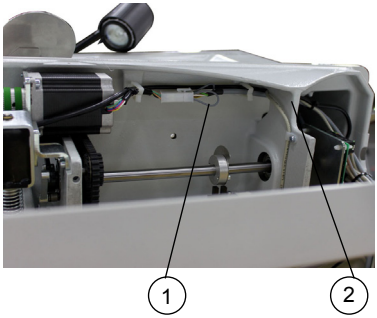
1. Lay the cables to the control cabinet and bundle them together with cable ties.
2. Plug the motor cables to the corresponding plugs on the connection side (2).
3. Plug the other cables to the corresponding plugs on the connection side (1).
4. Connect the LED light to the transformer, 📖 *6.9.14 Connecting the LED sewing light*, page 60.

6.9.4 Connecting the cables for the additional controller

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before connecting the cables to the additional controller.
Make sure the machine cannot be accidentally switched back on.

Figure 23: Connecting the cables for the additional controller



(1) - Cable
(2) - Underside of the casing

Steps

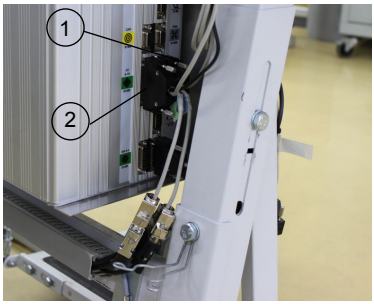
1. Connect the 15-pin plug to the correspondingly marked connector on the side of the control cabinet (2), as shown in 📖 *6.9.3 Connecting the cables to the upper part*, page 49.
2. Lay the cable (1) for the stepper motor in the underside of the casing (2) and plug it into the connection plug.

6.9.5 Connecting the setpoint transducers to the controller

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before connecting the setpoint transducers to the controller.
Make sure the machine cannot be accidentally switched back on.

Figure 24: Connecting the setpoint transducers to the controller



Steps

1. Connect the setpoint transducer for the main pedal to the “Speed” plug (1) (X120b).
2. Connect the setpoint transducer for the additional pedal to the “Fullness” plug (2) (X120t).

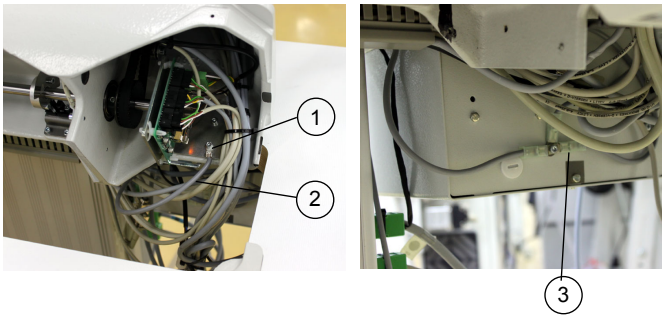
6.9.6 Connecting the equipotential bonding for the upper part

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before connecting the equipotential bonding for the upper part.
Make sure the machine cannot be accidentally switched back on.

The protective earth conductor (2) (350 mm long) is included in the accessories pack for the machine. The protective earth conductor (2) dissipates static charges which build up on the upper part of the machine to earth via the additional control cabinet.

Figure 25: Connecting the upper part equipotential bonding



(1) - Upper part attachment
(2) - Protective earth conductor
(3) - Tab connector

Steps

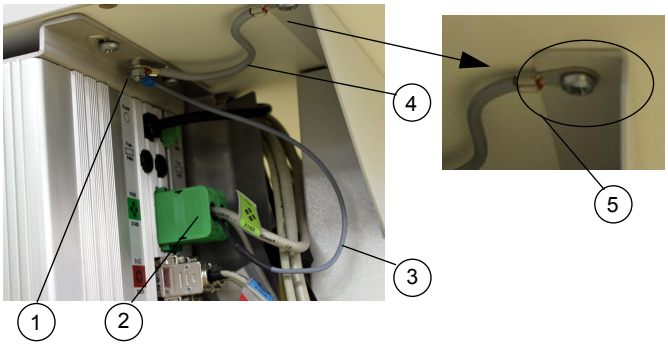
1. Screw the protective earth conductor (2) to the upper part (1), lay it to the additional control cabinet and plug it on the flat plug (3).

6.9.7 Connecting the equipotential bonding for the controller

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to Connecting the equipotential bonding for the controller.
Make sure the machine cannot be accidentally switched back on.

Figure 26: Connecting the equipotential bonding for the controller



(1) - Attachment to control cabinet
(2) - Plug
(3) - Protective earth conductor
(4) - Protective earth conductor
(5) - Attachment to the frame

Steps

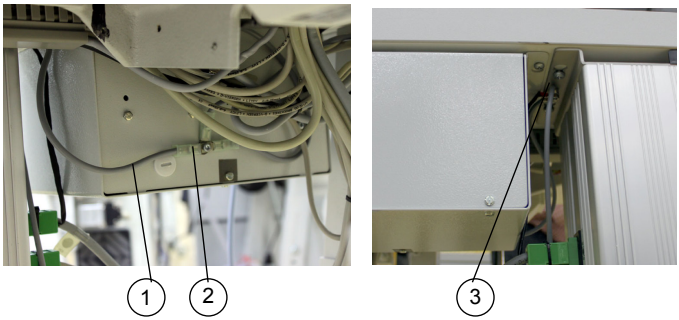
1. Screw the protective earth conductor (3) of the plug (2) on to the control cabinet (1).
2. Screw the protective earth conductor (4) (150 mm long) on to the frame (5) using a toothed shakeproof washer.

6.9.8 Connecting the equipotential bonding for the additional controller

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to establish equipotential bonding to the additional controller.
Make sure the machine cannot be accidentally switched back on.

Figure 27: Connecting the equipotential bonding for the additional controller



(1) - Protective earth conductor
(2) - Tab connector
(3) - Attachment to control cabinet

Steps

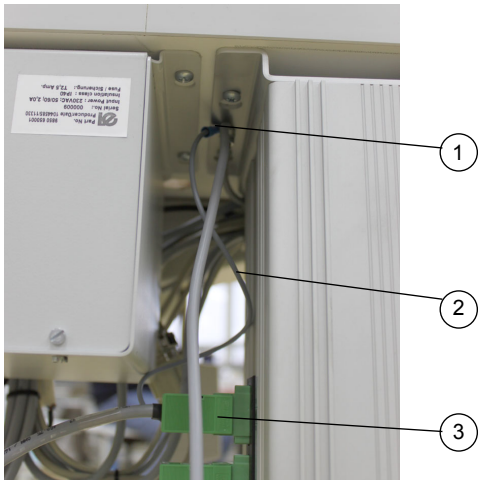
1. Plug the protective earth conductor (1) into the flat plug (2) on the additional control cabinet.
2. Lay the cable (2) (300 mm long) to the control cabinet (3) and screw it on.

6.9.9 Connecting the equipotential bonding for the sewing head motor

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to connect the equipotential bonding for the sewing head motor.
Make sure the machine cannot be accidentally switched back on.

Figure 28: Connecting the sewing head motor equipotential bonding



(1) - Earthing point on the control cabinet
(2) - Protective earth conductor
(3) - Plug for the sewing head drive

The protective earth conductor (2) for the sewing head motor is connected in the plug (3) for sewing head drive.

Steps

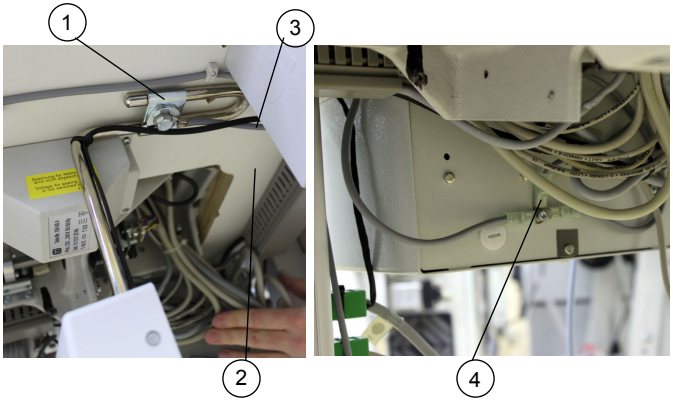
1. Screw the protective earth conductor (2) to the earthing point on the control cabinet (1).

6.9.10 Connecting the equipotential bonding for the knee switch

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to connect the equipotential bonding for the knee switch.
Make sure the machine cannot be accidentally switched back on.

Figure 29: Connecting the equipotential bonding for the knee switch



(1) - Mounting clip
(2) - Cable duct
(3) - Protective earth conductor
(4) - Tab connector

Steps

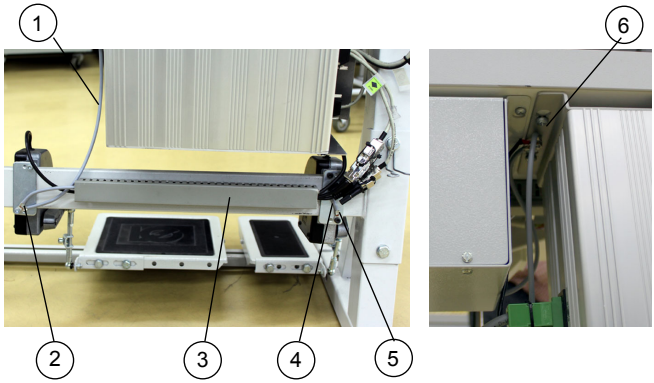
1. Screw the protective earth conductor (3) (650 mm long) to the attachment clip (1) on the knee switch.
2. Lay the cable in the cable duct (2) and plug the additional controller on to the flat plug (4).

6.9.11 Connecting the equipotential bonding for the setpoint transducers

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to connect the equipotential bonding for the setpoint transducers.
Make sure the machine cannot be accidentally switched back on.

Figure 30: Connecting the equipotential bonding for the setpoint transducers



(1) - Protective earth conductor
(2) - Setpoint transducer connection (main pedal)
(3) - Cable duct
(4) - Protective earth conductor
(5) - Setpoint transducer connection (additional pedal)
(6) - Attachment to control cabinet

Steps

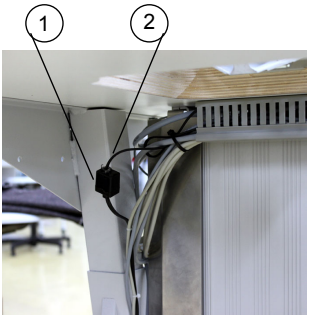
1. Screw the protective earth conductor (4) (500 mm long) on to the setpoint transducer (5) (optional).
2. Lay the cable (4) through the cable duct (3) to the setpoint transducer (2) and screw it on (optional).
3. Screw the protective earth conductor (1) (650 mm long) on to the setpoint transducer (2) and to the control cabinet (6).

6.9.12 Connecting the knee switch

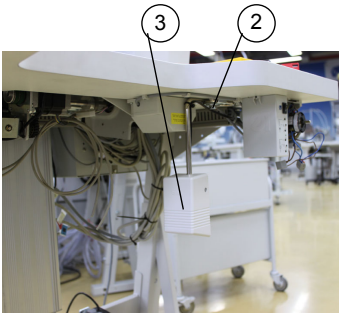
DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to connect the knee switch.
Make sure the machine cannot be accidentally switched back on.

Figure 31: Connecting the knee switch



(1) - Plug
(2) - Cable



(3) - Knee switch

Steps

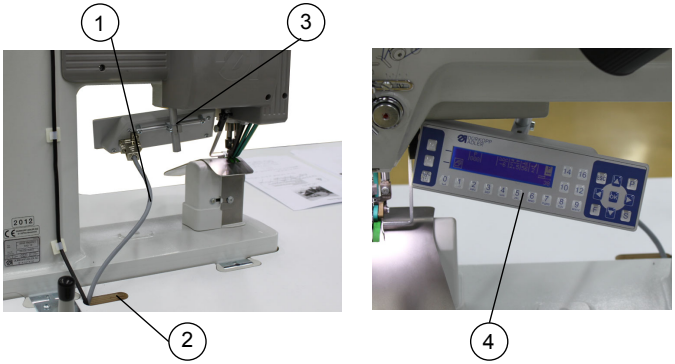
1. Lay the cable (2) for the knee switch (3) through the cable duct to the controller and connect it to the plug (1).

6.9.13 Connecting the control panel

DANGER

Danger of life-threatening electric shock
Disconnect the power plug before starting to connect the control panel.
Make sure the machine cannot be accidentally switched back on.

Figure 32: Connecting the control panel



(1) - Cable
(2) - Table top opening
(3) - Retainer
(4) - Control panel

Steps

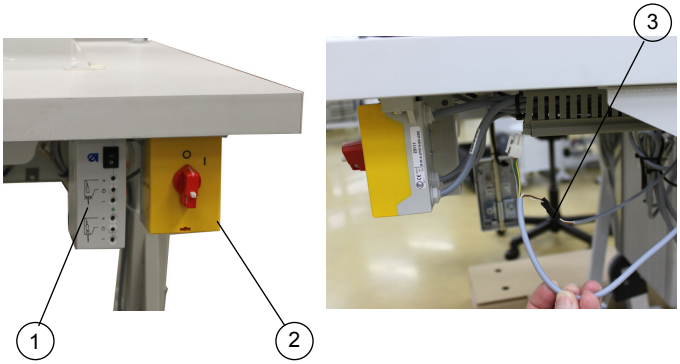
1. Screw the control panel (4) on the bracket (3) and align it.
2. Plug the plug for the cable (1) on to the control panel, through the opening in the table top (2) to the control cabinet, and connect it to the socket (X170 Panel).

6.9.14 Connecting the LED sewing light

DANGER

Danger of life-threatening electric shock
The sewing light switch is connected directly to the mains supply and is live even when the main switch is switched off.
Disconnect the power plug without fail before connecting the sewing light.
Make sure the power plug cannot be accidentally plugged back in.

Figure 33: Connecting the LED sewing light



(1) - Sewing light controller
(2) - Main switch
(3) - Plug

Steps

1. Fit the sewing light controller (1) next to the main switch (2), 📖 *6.4 Pre-assembling the table top*, page 42.
2. Connect the supply cable for the sewing light controller within the main switch, 📖 *6.9.2 Connecting the mains power supply*, page 48.
3. Connect the plug (3) for the LED light to the black plug of the sewing light controller output cable.

6.9.15 Connect the additional sewing light (Waldmann) (optional)

See the installation manual 0791 100702. This manual is supplied with the sewing light.

6.10 Sewing test

Perform a sewing test after completing the installation work.

WARNING

Risk of injury from pointed and moving parts
Switch off the sewing machine before threading the needle thread or hook thread.

Steps

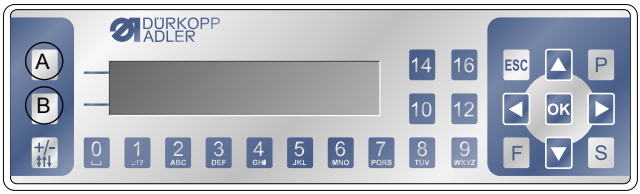
1. Insert the mains plug.
2. Wind on the hook thread, 📖 page 28.
3. Switch the main switch on.
4. Activate winder mode.
5. Fill the bobbin at medium speed.
6. Switch off the main switch.
7. Thread the needle and hook threads, 📖 page 25 and 📖 page 30.
8. Switch the main switch on.
9. Select the material to be sewn.
10. Perform a sewing test, first at low speed and then at continually increasing speeds.
11. Check that the seams conform to the desired requirements.
12. If the requirements are not satisfied:
    Alter the thread tension, 📖 page 26 and 📖 page 32.

If necessary, also check the settings listed in the service manual and correct them as required.

7 Controller with the OP3000 control panel

7.1 OP3000 control panel

Figure 34: Control unit panel



All settings in the controller for the 650-16 are performed using the OP3000 control panel.

Key	Function
0 to 16	Setting the fullness Inputting the parameter value (if the field for the parameters is activated) Selection of a parameter that is shown in the display • Press the key under the desired symbol. The function is selected.
ESC	Cancel the function Exit the menu
OK	Confirm the settings Activate the input
P	Function is different for each menu
S	Function is different for each menu
F	Function is different for each menu
▶	Selection to the right
◀	Selection to the left Back one menu level
▲	Increase the value Scroll through the list (upwards)
▼	Decrease the value Scroll through the list (downwards)

Key	Function
A	Upper softkey - 1 Assignment is different for each menu
B	Upper softkey - 2 Assignment is different for each menu
+/-	Switch between increase and decrease the fullness

7.2 Switching the sewing machine on

Figure 35: Display of the firmware and software version

1. Switch the main switch on.

↳ The software version appears on the display:

- On the left of the screen the control panel firmware
- On the right of the screen the controller software version

↳ The machine performs a reference run:
The display shows the program last used, or manual mode.

Figure 36: Display of the program last used

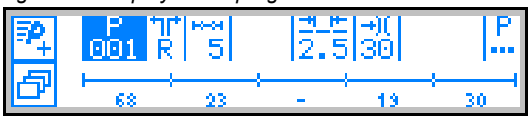
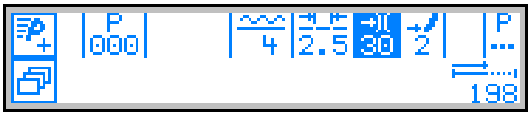


Figure 37: Display in manual mode



7.3 Controller operating modes

The 650-16 controller has 4 available operating modes:

- **Manual mode (program 000)**

  Manual mode is the simplest operating mode. There are no sewing programs and no inputs for individual sewing steps.

  Changes to the fullness, stitch length, thread tension, curve support and also the activation of other functions are always implemented immediately.

  Thus all the major sewing parameters can be changed manually during the sewing process.

- **Automatic mode (program 001 - 999)**

  Automatic mode allows sewing programs to be executed.

  The seams are divided into individual sections (steps) within the sewing programs. Each step is assigned its own individual sewing parameters such as fullness, curve support etc.

- **Quick programming**

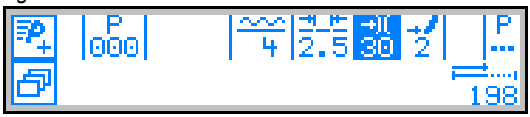
  Quick programming allows very quick and simple creation of new sewing programs.

- **Programming mode**

  Programming mode allows new sewing programs to be created, edited, deleted, copied, and mirrored (left sleeve / right sleeve).

7.4 Manual mode

Figure 38: Parameters in manual mode



The following table shows the individual symbols (parameters) in the display and the functions of the keys on the control panel.

When a parameter is selected, its color on the display changes. When a parameter is changed, its new value is loaded immediately.

Symbol	Meaning
	(depending on the assignment) Quick programming • Press the upper softkey
	Quick access function (softkey menu) • Press the lower softkey, 🕮 *7.4.1 Quick access function (softkey menu)*, page 68.
	Program number Value range: 000 to 999 Program 000 indicates that the controller is in “Manual mode”. • Use ◀ / ▶ to select the “Program” parameter. • Use ▲ / ▼ to change the program number. Or: • Input the program number directly using the keys “0” to “9” and confirm with “OK” as required. ↳ This takes you into “Automatic mode”.
	Fullness Value range: Upper fullness: 0 to 16 Lower fullness: 0 to -6 • Use the keys “0” to “16” to select the desired value. • Use the “+/-” key to select upper or lower fullness. Or: • Use the second pedal to select the fullness, if fitted.
	Stitch length Value range: 1.0 to 5.5 mm • Use ◀ / ▶ to select the “Stitch length” parameter. • Use ▲ / ▼ to change the stitch length

Symbol	Meaning
	Thread tension Value range: 1 to 99 • Use ◀ / ▶ to select the “Thread tension” parameter. • Use ▲ / ▼ to change the thread tension
	Curve support Value range: 0 to 6 • Use ◀ / ▶ to select the “Curve support” parameter. • Use ▲ / ▼ to change the curve support
	Other parameters 📖 *7.4.2 Menu for other settings*, page 69
	Seam length in mm After the thread has been cut off, the display is retained. Measurement restarts when sewing starts again.
P	**Creating a program** 📖 *7.8.1 Creating a program*, page 82
+/-	**Switch between upper and lower fullness**
ESC, F and S	No function assigned
0 – 16	**Fullness values**
OK	No function assigned

7.4.1 Quick access function (softkey menu)

Here you have quick access to functions during the sewing process and can also assign a function to the upper softkey.

1. Press the lower softkey .

↳ The following information is shown on the display:

Figure 39: Softkey menu

2. **Call up a function:**
   - Press the numeric key under the designed function.

or

Assigning a function to the upper softkey:

- Press the numeric key under the designed function and at the same time press the upper softkey.

↳ The function is assigned to the upper softkey and can be called up by pressing the key.

3. Press ESC to exit the menu.

Symbol	Meaning
	Manual bartack • Press the key “1” and keep it pressed for a manual bartack.
	Bartack suppression on/off • Press the key “2”. ↳ The bartacks are switched on or off.
	Needle position up / down • Press the key “3”. ↳ If sewing is stopped within the seam, the needle is positioned up or down.
	Automatic step progression on/off (available only in Automatic mode) • Press the key “4”. ↳ Automatic step progression is enabled/disabled whilst sewing a seam.

Symbol	Meaning
	Quick programming Press the key “5”. Quick programming starts.
	Bobbin mode • Press the key “6”. • Push the pedal halfway backwards. Bobbin mode is ended.

7.4.2 Menu for other settings

1. Use ◂ / ▸ to select the “Other parameters”.
2. Press the “OK” key.
3. Use ▲ / ▼ to select the desired parameter.
4. Select the parameter using the “OK” key.
5. Change values using the ▲ / ▼ keys.
6. Click on the “OK” button to confirm.
7. Press ◂ or “ESC” to exit the menu.

Symbol	Meaning
	Alternate (foot alternation) Value range: 0.0 to 2.5 mm
	Foot Press. (presser foot pressure) Value range: 1 – 15
	Start Tack (bartack at the start of a seam) Value range: on/off
	End Tack (bartack at the end of a seam) Value range: on/off
	Thread Trim (thread cutoff) Value range: on/off

7.4.3 Sewing process

Sewing without fullness

1. Input values for stitch length, thread tension, curve support and foot alternation.
2. Push the pedal forwards and sew.

Sewing with fullness

1. Change the fullness with the left pedal (optional) (if set at the technician level).

Or:

1. Alter the fullness using the “0” to “16” and “+/-” keys.

Altering parameters whilst within the seam

1. Move the pedal to the “0” position.
2. Change the desired parameter on the control panel.
3. Push the pedal forwards again and sew.

↳ The seam will be sewn using the altered parameter value.

7.5 Automatic mode

Program numbers 001 to 999.

1. Use ◀ / ▶ to select the “Program” parameter.
2. Use ▲ / ▼ to select the program number “1” or another one if available.

↳ The controller switches to automatic mode and the following information appears in the display:

Figure 40: Display in Automatic mode

The following table shows the individual symbols in the display and the functions of the keys on the control panel.

7.5.1 Before starting sewing

Symbol	Meaning
	Quick programming (depending on the assignment) • Press the upper softkey
	Quick access function (softkey menu) • Press the lower softkey
	Program number Value range: 000 to 999 • Use ◀ / ▶ to select the “Program” parameter. • Use ▲ / ▼ to change the program number. Or: • Input the program number using the 0 - 9 keys and confirm with “OK” as required. If you select program 000, the controller selects Manual mode

Symbol	Meaning
	Right sleeve / left sleeve The machine can sew only right sleeves, only left sleeves, or right and left sleeves alternately • Use ▲/▼ to select a right sleeve or a left sleeve (if programs exist for both).
	Steps Number of steps contained in the current program.
	Stitch length Value range: 1.0 to 5.5 mm The stitch length can be altered before starting sewing. The altered value applies throughout the entire sewing program. • Use ◀/▶ to select the “Stitch length” parameter. • Use ▲/▼ to adjust the stitch length.
	Thread tension Value range: 1 to 99 The thread tension can be altered before starting sewing. The altered value applies throughout the entire sewing program. Use ◀/▶ to select the “Thread tension” parameter. • Use ▲/▼ to change the thread tension
	Other parameters Foot Press. (presser foot pressure) Fulln.Corr. (fullness correction) • Use ◀/▶ to select the “Other parameters” parameter. • Press the “OK” key. • Use ▲/▼ to select the fullness correction or the presser foot pressure. • Select the parameter using the “OK” key. • Change values using ▲/▼. • Click on the “OK” button to confirm. • Press ◀ or “ESC” to exit the menu.
	Program bar Length per step in mm, or a dash (-) if no automatic step progression

Symbol	Meaning
P	**Programming mode** Switches into programming mode.
ESC, F, S	No function assigned

1. Sew, press the knee switch or press the “OK” key.

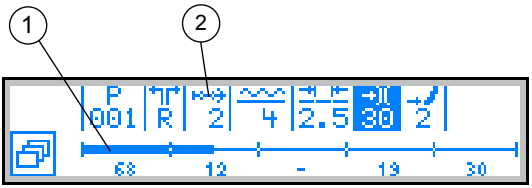
↳ The program switches to the 1st step.

7.5.2 Sewing process

1. Push the pedal forwards and sew.

↳ The following information is shown on the display:

Figure 41: Display when sewing in Automatic mode



(1) - Program bar *(2) - Current step*

The parameter values for the current step are shown in the display.

The program bar (1) shows the progress of the seam.

The number under the current step shows the outstanding length of the step.

The program bar shows half the current step in bold.

Figure 42: Current step

Completed steps are shown fully in bold.

Figure 43: Completed step

The following table lists the functions that can be performed in the course of the seam.

Key/Pedal	Function
+/- and 0 - 16	**Temporary correction of the fullness value** (valid only for the current step)
2nd pedal (optional)	**Temporary correction of the fullness value or the curve support** (depending on the setting in the technician level) (valid only for the current step)
Knee switch	**Next program step**
◀ / ▶ 3	**Stop forward/back or to the start of the step** **Switch the sleeve side** (if programmed) in the 1st step at the start of the step
▲ / ▼	**Correction of the thread tension** The value is saved.
ESC, P, F, S, OK	No function assigned
Pedal halfway back	**Raise the presser foot**
Pedal fully back	**Cut off the thread** The program remains stopped at the cutoff point.
Lower softkey	**Softkey menu** 📖 *7.4 Manual mode*, page 66

7.5.3 Canceling the program

1. Cut off (push the pedal fully back).
2. Press the “ESC” key.

Or:
Push the pedal fully back

↳ The program is interrupted.

7.6 Quick programming

If is assigned to the upper softkey:

1. Press the upper softkey .

↳ The following display appears:

Figure 44: Quick programming

2. Continue with handling step 3.

If is not assigned to the upper softkey:

1. Press the key.

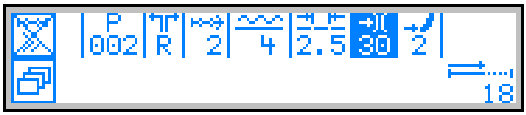
↳ The softkey menu appears.

Figure 45: Softkey menu

2. Press the key “5”.
3. Use ▲ / ▼ or the keypad keys 0 – 9 to select a program number.
4. Press the “OK” key.

↳ The following information is shown on the display, the “P” in the program number field flashes:

Figure 46: Quick programming display



The following table shows the individual symbols in the display and the functions of the keys on the control panel.

Symbol	Meaning
>>	**Automatic step progression on/off** • Press the upper softkey Activates / deactivates automatic step progression for the current step.
P 002	**Current program to be created**
R	**Current sleeve side to be created** (pre-set at the technician level)
2	**Current step** • Use ◀ / ▶ to select the “Step” parameter. • Use ▲ / ▼ to switch to the next/previous step. • Press the “OK” key to edit other parameters for the step, 📖 *7.7 Edit mode*, page 79.
4	**Fullness** Value range: -6 to 16 • Use the keys “0” to “16” to select the desired value. Or: • Use the second pedal to select the fullness, if fitted. • Use the “+/-” key to select upper (+) or lower (-) fullness.
2.5	**Stitch length for the current step** Value range: 1.0 to 5.5 mm • Use ◀ / ▶ to select the “Stitch length” parameter. • Use ▲ / ▼ to change the stitch length.

Symbol	Meaning
	Thread tension Value range: 0 to 99 • Use ◀ / ▶ to select the “Thread tension” parameter. • Use ▲ / ▼ to change the thread tension.
	Curve support Value range: 0 to 6 • Use ◀ / ▶ to select the “Curve support” parameter. • Use ▲ / to change the curve support.
	Length of the current step in mm

7.6.1 Creating a program by keyboard input

1. Set all the parameters for each step.
2. Step through to the next step using the knee switch.

Cancel with ESC
Before the “S” key is pressed, program creation can be canceled at any time by pressing the “ESC” key.

Once all steps are complete:

3. Press the “S” key.

↳ The program is saved.

Depending on the settings at the technician level

- The sleeve side that was created is mirrored
- The sleeve side that was created is not mirrored
- The teach-in for the 2nd sleeve side is opened
- The selection screen for the action of creating the 2nd sleeve side is opened

↳ The machine switches to Automatic mode.
The program that was just created is selected.

Figure 47: Displaying the newly created program

7.6.2 Creating a program by sewing the seam

1. Insert the material to be sewn.
2. Input the parameters for the 1st step (fullness, stitch length, thread tension and curve support).
3. Sew the first step.
4. Operate the knee switch.

↳ The program switches to the next step.

Cancel with ESC
Before the “S” key is pressed, program creation can be canceled at any time by pressing the “ESC” key.

If a section of seam has already been sewn the program will have been saved and must if necessary be deleted, 📖 *7.8.3 Deleting a program*, page 85.

Once all steps are complete:

5. Press the “S” key.

↳ The program is saved.
The following display appears:

Figure 48: Display after creating a program by sewing the seam

6. Sew the overlap.
7. Push the pedal fully back.

↳ The sleeve that was created is mirrored, depending on the settings at the technician level.
The machine switches to Automatic mode.
The program that was just created is selected.

Figure 49: Displaying the newly created program

7.7 Edit mode

Edit mode allows existing programs to be edited or deleted. Programming mode should be used to create new programs,
📖 *7.8 Programming mode*, page 82.

1. In Automatic mode, press the “P” key.

↳ The controller switches to Edit mode.
The program previously selected can now be edited.
The following information is shown on the display,
the “P” in the program number field flashes:

Figure 50: Display in Edit mode

1. Use ◂ / ▸ to select the program to be edited, the sleeve side and the step; and use ▴ / ▾ to deselect them.

The step to be edited can also be selected using the knee switch.

↳ The selected step is shown bold in the program bar.

2. Use ◂ / ▸ to select the parameter to the changed for the respective step, and use ▴ / ▾ to change it.

7.7.1 Changing further parameters for the current step

1. Use ◂ / ▸ to select the field 2.
2. Press the “OK” key.

   ↳ The submenu opens.
3. Use ▲ / ▼ to select the desired parameter.
4. Press the “OK” key to activate or deactivate the parameter, or use ▲ / ▼ to change its value and press “OK” to confirm it.

Symbol	Meaning
	Step. Len. (step length)
	Auto Forward (automatic step progression)
	Alternate (sewing foot alternation)
	Foot Press (presser foot pressure)

5. Exit the submenu using “ESC” or ◂

7.7.2 Changing further parameters for the selected program

This menu allows further parameters for the current sewing program to be changed.

1. Use ◂ / ▸ to select the field P ▪▪▪ .
2. Press the “OK” key.

↳ The submenu opens.

3. Use ▲ / ▼ to select the desired parameter.
4. Press the “OK” key to activate or deactivate the parameter, or use ▲ / ▼ to change its value and press “OK” to confirm it.

Symbol	Meaning
	Thr. Tens (thread tension)
	Stitchlen. (stitch length)
	Foot Press. (presser foot pressure)
	Fulln. Corr. (fullness correction)
	Start Tack (bartack at the start of a seam)
	End Tack (bartack at the end of a seam)
	Thread Trim (thread cutoff)

5. Exit the submenu using “ESC” or ◂

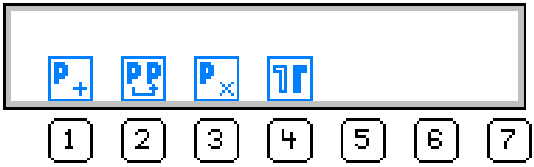
7.8 Programming mode

7.8.1 Creating a program

1. In Edit mode, press the key.

↳ The softkey menu appears.

Figure 51: Softkey menu



2. Press the key.

↳ The following display appears:

Figure 52: Select the program number

The controller displays the next free program number.

3. Press “OK” to load the program number.

   Or:

   Select another program number using ▲/▼ or input a program number using the keypad keys “0 - 9” and then press “OK”.

↳ The program number is loaded.
The following display appears, with “P” flashing:

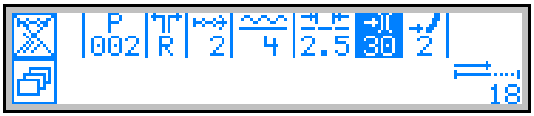
Figure 53: Display after specifying the program number

4. If necessary change the sleeve side or other parameters, 🕮 *7.7 Edit mode*, page 79.

5. Press the key.

↳ The following display appears, with “P” flashing:

Figure 54: Inputting parameters when creating a new program



The rest of the procedure is as described in the section *<reference> Quick programming*, 📖 *7.6 Quick programming*, page 75.

6. Select whether progression to the individual steps to be programmed should be by using the knee switch or by automatic progression.
7. Press the key.

Once the creation of the program is complete and the “S” key has been pressed or after the thread cutoff has been entered, the following query window appears:

Figure 55: Query window after creation of a program

8. Select whether
   - the sleeve side that was programmed should be mirrored
   - the sleeve side that was programmed should not be mirrored
   - the teach-in for the 2nd sleeve side should be opened.

7.8.2 Copying the program

The selected program is copied into a new program number.

1. Press the key.

↳ The softkey menu appears.

Figure 56: Softkey menu

2. Press the key.

↳ The following display appears:

Figure 57: Copying the program

↳ The controller displays the next free program number.

3. Press “OK” to load the program number.

   Or:

   Select another program number using ▲/▼ or input a program number using the keypad keys “0 - 9” and then press “OK”.

↳ The program number is loaded.
The following display appears, with the program number flashing:

Figure 58: Display after specifying the program number

4. Load the desired changes into the new program.
5. Press the “ESC” key.

↳ The controller exits Programming mode and reverts to Automatic mode.

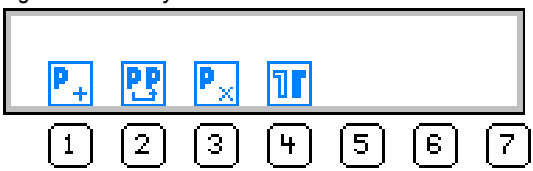
7.8.3 Deleting a program

The selected program is deleted.

1. Press the key.

↳ The softkey menu appears.

Figure 59: Softkey menu



2. Press the key.
3. Press the “ESC” key.

↳ The controller exits Programming mode and reverts to Automatic mode.

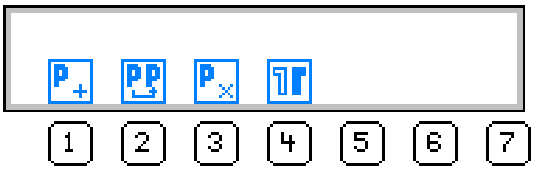
7.8.4 Mirroring the program

The sleeve side already programmed is mirrored over to the other sleeve side.

1. Press the key.

↳ The softkey menu appears.

Figure 60: Softkey menu



2. Press the key.
3. Press the “ESC” key.

↳ The controller exits Programming mode and reverts to Automatic mode.

8 Controller with the OP7000 control panel

8.1 OP7000 control panel

All settings for the 650 sewing machine are performed using the OP7000 control panel.

Figure 61: OP7000 control panel

The activation of the sewing motor and the stepper motors is performed by the DAC3 controller in conjunction with the OP7000 control panel with the user interface in symbolic representation.

The program automation permits either manual or automatic control of fullness, optionally upper or lower, curve support and also the programming of sewing steps with individual parameters.

Up to 999 sewing programs can be saved.

Each sewing program can contain up to 30 sewing steps.
Each sewing step can be assigned various parameters such as stitch length, fullness values, curve support, thread tension, segment length etc.

The seam programs are displayed continuously whilst sewing is in progress. Programs can be mirrored for the other side of the sewing material.

8.2 Switching the sewing machine on

1. Switch the main switch on.

↳ The OP7000 control panel is switched on.

- The machine class is shown on the left of the display, the firmware is shown on the right.
- The machine performs a reference run.
- The control panel starts in the mode that was active when it was switched off - **MAN** or **AUTO**.

8.3 Controller operating modes

The controller has four operating modes available:

- **Manual mode MAN**

  Manual mode is the simplest operating mode.

  There are no sewing programs and no inputs for individual sewing steps.

  Changes to the fullness, stitch length, thread tension, curve support and also the activation of other functions are implemented immediately.

  Thus all the major sewing parameters can be changed manually during the sewing process.

- **Automatic mode AUTO**

  Automatic mode allows sewing programs to be executed.

  The seams are divided into individual sections within the sewing programs. Each step is assigned its own individual sewing parameters such as fullness etc.

- **Programming mode**

  In Programming mode, new seam programs can be created (PROGRAMMING), existing seam programs can be edited, deleted, copied and mirrored (EDIT) and also optimized (Length Correction).

- **Service mode SERVICE**

  Service mode contains functions for use during service work.

  Service mode is password-protected, to avoid accidentally changing the machine settings.

8.4 General operation

Operation is performed using the control panel. All functions and inputs are triggered by touching the screen.

Numeric values for the individual parameters and text for the program names can be input in the individual operating modes.

The inputs are performed using separate user interfaces.

8.4.1 Inputting numeric values

Figure 62: Inputting numeric values

The user interface for inputting numeric values consists of the following elements:

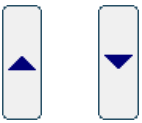
Header, consisting of:

- Symbol of the selected parameter
- Name of the parameter
- Value range of the parameter
- Symbol for exiting the user interface

Input line for the value

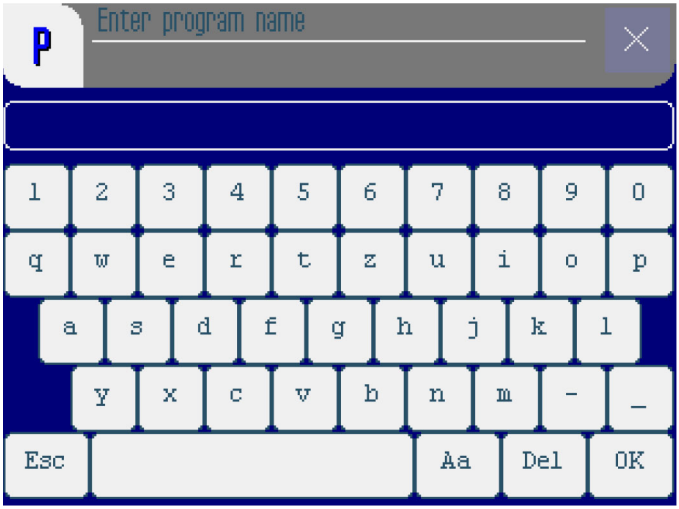
Keypad

Meaning of the buttons

Symbols/buttons	Meaning
	Value input
	Change of plus/minus sign
	Input of a decimal point for values that permit places of decimals
	Changing the value incrementally up or down
	Delete the input value
	Exit the user interface without inputting or saving any values
	Save the value that was input and exist the user interface

8.4.2 Entering text

Figure 63: Entering text



The user interface for inputting text consists of the following elements:

Header, consisting of:

- Symbol for a new seam program
- Symbol for exiting the user interface

Input line for the text

Keypad

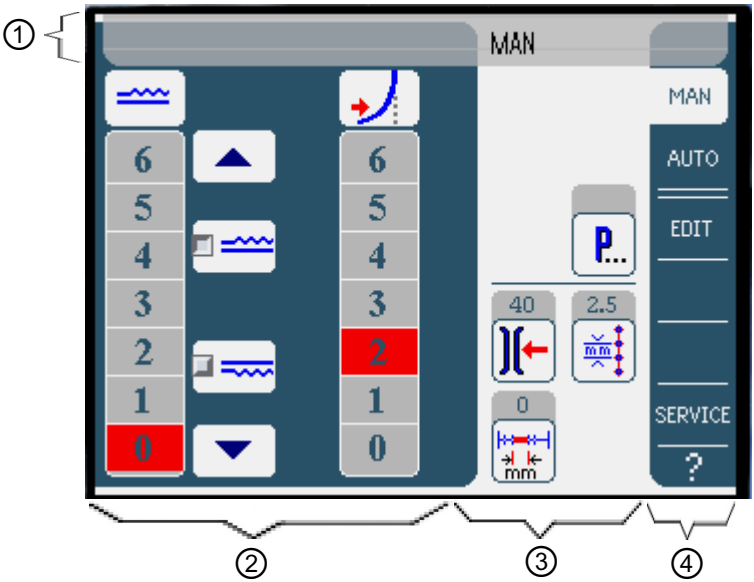
Meaning of the buttons

Symbols/buttons	Meaning
0 9	Input of numbers in the text
a z	Input of text

Symbols/buttons	Meaning
-	Input of a hyphen
_	Input of a underscore
Esc	Exit the user interface without inputting or saving any text
	Input of a space
Aa	Switching between upper case/lower case
Del	Delete letters/digits from the input line
OK	Save the value that was input and exist the user interface

8.5 Manual mode MAN

Figure 64: Manual mode MAN



Header (1)

Operating mode **MAN** is displayed.

Left pane (2)

Buttons for manually inputting the fullness and the curve support are displayed here.

Middle pane (3)

The symbols for all the parameters that can be set are displayed here. The gray fields above the parameter symbols show the respective current values.

Right pane (4)

Another user interface or another operating mode can be selected here.

8.5.1 Parameters that can be set in MAN mode

The following table lists the parameters that can be set in **MAN** programming mode.

Symbols	Meaning
	Setting the fullness, 📖 page 95
	setting the curve support.
	Other program parameters in manual mode **MAN,** 📖 page 96
	Inputting the needle thread tension
	Inputting the stitch length in mm

1. Press the desired button.

↳ The user interface for setting the parameter is displayed.

For some parameters the setting is more than just a numerical value. These parameters are described below.

MAN mode **Setting the fullness**

The following table lists the symbols and buttons for manually setting the fullness.

Symbols/buttons	Meaning
	Inputting the fullness The fullness setting is displayed by a button highlighted in red.
	Select the type of fullness: • Upper (upper transport) • Lower (lower transport) The fullness selected is displayed in an activated control field.
	Display of further buttons for inputting the fullness. The buttons 0 to 16 are available for input.

1. Select the type of fullness.

↳ The type of fullness selected is displayed in an activated control field within the symbol.

2. If a higher or lower degree of fullness is required, use the arrow keys to display more buttons.
3. Input the fullness using the buttons **0** to **16**.

Setting the curve support

The following table lists the symbols and buttons for manually setting the curve support.
The default setting is a value of 2.

Symbols/buttons	Meaning
	Inputting the curve support The curve support is displayed by a button highlighted in red.

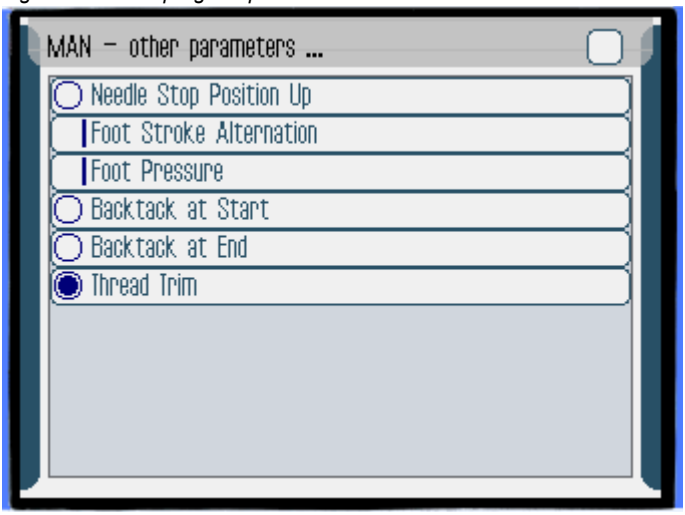
1. Input the curve support using the buttons **1** to **6**.

MAN mode

Other program parameters

After the **Other program parameters** button has been pressed, an overview of all the available parameters is displayed.

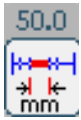
Figure 65: Other program parameters in MAN mode



Parameters	Meaning
Needle Stop Position Up	When sewing stops the needle position is up (activated) or down (not activated)
Foot Stroke Alternation	Presser foot alternation whilst the needle is in the seam Value range: 0 ... 2.5 mm
Foot Pressure	Presser foot pressure Value range: 1 ... 10
Backtack at Start	Backtack at start of the seam on (activated) or off (not activated)
Backtack at End	Backtack at end of the seam on (activated) or off (not activated)
Thread Trim	Thread cutoff at end of the seam on (activated) or off (not activated)

8.5.2 Sewing process

1. Set the fullness (📖 page 95).
2. Set the curve support.
3. Input the values for **needle thread tension** and **stitch length**.
4. Push the pedal forwards and sew.



↳ The length in mm sewn in the seam is displayed.
When the thread is cut off, the display is reset.

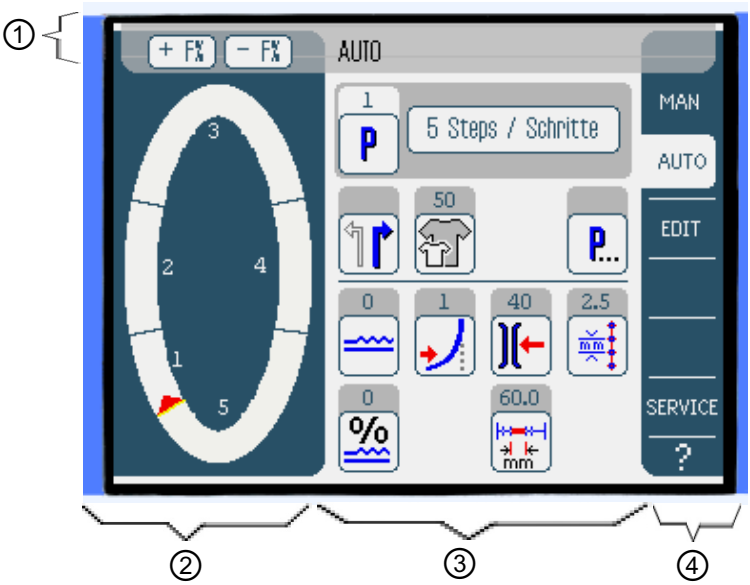
Changing parameters during the seam

1. Move the pedal to the 0 position.
2. Change the desired parameter on the control panel (📖 page 94).
3. Push the pedal forwards and sew.

↳ The seam will be sewn using the altered parameter value.

8.6 Automatic mode AUTO

Figure 66: Automatic mode AUTO



Header (1)

The **AUTO** operating mode is displayed. The buttons **+ F%** and **- F%** offer quick access for setting the fullness values in %.

Left pane (2)

The graphical representation of the entire seam, divided into the number of programmed sewing steps, is displayed here. A red bar with an arrowhead indicates the direction of sewing and progress of the sewn seam.

Middle pane (3)

The number and the name of the selected seam program are displayed here, together with the symbols for all the parameters that can be set. The gray fields above the parameter symbols show the respective current values.

Right pane (4)

Another user interface or another operating mode can be selected here.

8.6.1 AUTO parameters that can be set

The following table lists the parameters that can be edited in **AUTO** programming mode.

Symbols	Meaning
	Program selection, 📖 page 100
	Select the right or left piece to be sewn
	Set the sewing material size, 📖 page 101
	Other program parameters in **AUTO** automatic mode, 📖 page 104
	Temporarily setting the fullness value until the next sewing step, 📖 page 102
	Applying a % correction to the fullness values of all sewing steps, 📖 page 103
	Setting the needle thread tension. If the value is changed in AUTO Automatic mode it is permanently saved in the program.
	Setting the stitch length in mm. If the value is changed in AUTO Automatic mode it is permanently saved in the program.

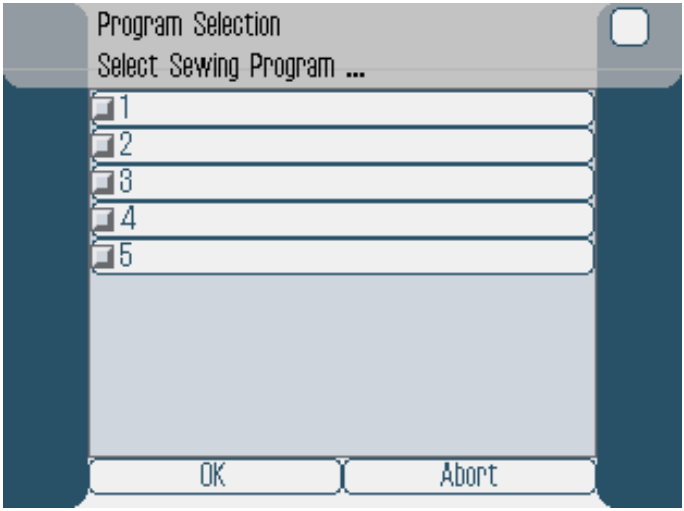
1. Press the desired button.

↳ The user interface for setting the desired parameter is displayed.

For some parameters the setting is more than just a numerical value. These extended parameters are described in detail below.

AUTO mode **Program selection**

Figure 67: Program selection parameter



1. Press on the desired seam program.

↳ The seam program selected is displayed in an activated control field within the line.

2. Press the **OK** button.

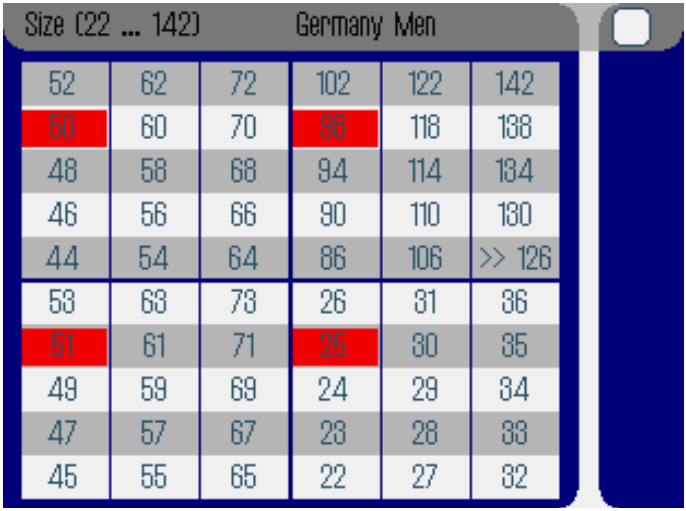
↳ The seam program selected is loaded in Automatic mode **AUTO**.

3. Press the **Abort** button to cancel the selection of the program.

↳ If necessary the seam program selected is discarded and the user interface for the Automatic mode **AUTO** is displayed.

AUTO mode **Setting the sewing material size**

Figure 68: Setting the sewing material size parameter



The following information is displayed:

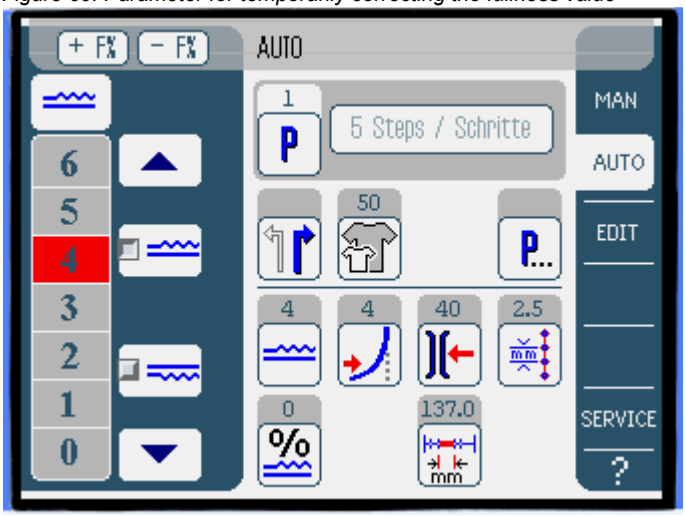
- The currently selected size is indicated by a double arrow (>>).
- The sizes highlighted in red represent the reference sizes for the graduation logic.

1. Press on the desired sewing material size.

↳ The user interface for the Automatic mode **AUTO** is displayed.

AUTO mode **Temporarily correcting the fullness value until the next sewing step**

Figure 69: Parameter for temporarily correcting the fullness value



Buttons for manually inputting the fullness are displayed in the left pane.

Symbols/buttons	Meaning
	Input the fullness The fullness setting is displayed by a button highlighted in red.
	Select the type of fullness: • Upper (upper transport) • Lower (lower transport) The fullness selected is displayed in an activated control field.
	Display of further buttons for inputting the fullness. The buttons 0 to 16 are available for input.

1. Select the type of fullness.

↳ The type of fullness selected is displayed in an activated control field within the symbol.

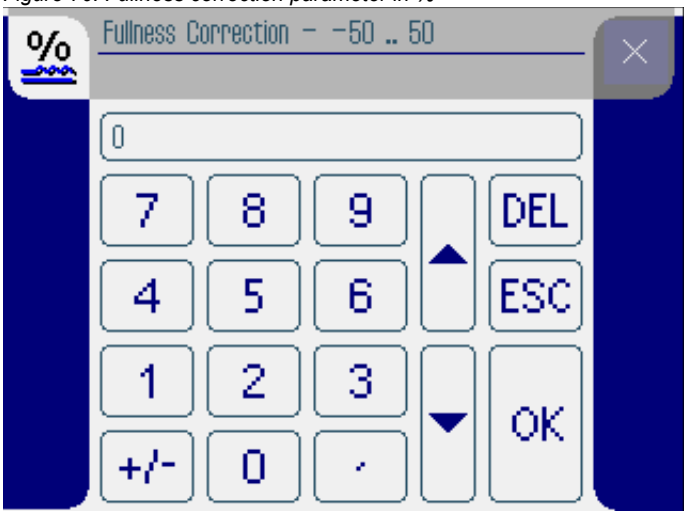
2. If a higher or lower degree of fullness is required, use the arrow keys to display more buttons.
3. Input the fullness using the buttons **0** to **16**.

The fullness value remains active until the next sewing step.

AUTO mode **Correcting the fullness ratio**

The fullness ratio can be set either by the buttons **+ F%** and **- F%** or the fullness correction parameter.

Figure 70: Fullness correction parameter in %



1. Input the correction value for the fullness in percent.

   Information for inputting numeric values: 📖 page 89.
2. Press the **OK** button.

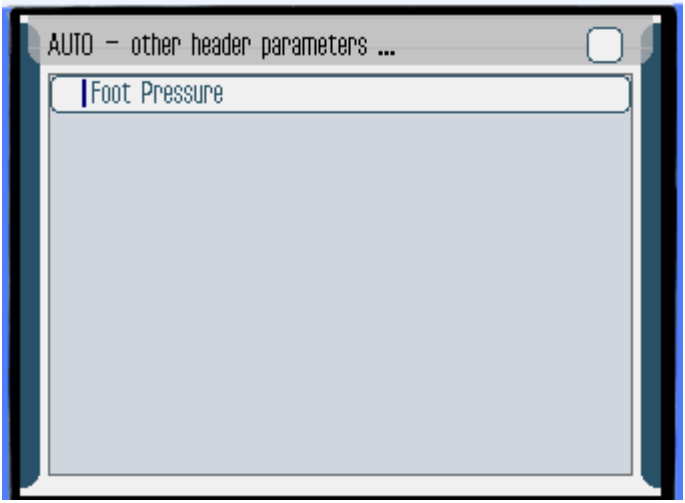
↳ The correction value is saved and the previous user interface is displayed.

If the correction value is changed in AUTO Automatic mode it remains active until the controller changes to the next program.

AUTO mode **Other program parameters**

After the **Other program parameters** button has been pressed, an overview of all the available parameters is displayed.

Figure 71: Other program parameters in AUTO mode



Parameters	Meaning
Foot Pressure	Presser foot pressure Value range: 1 ... 10

8.6.2 Sewing process

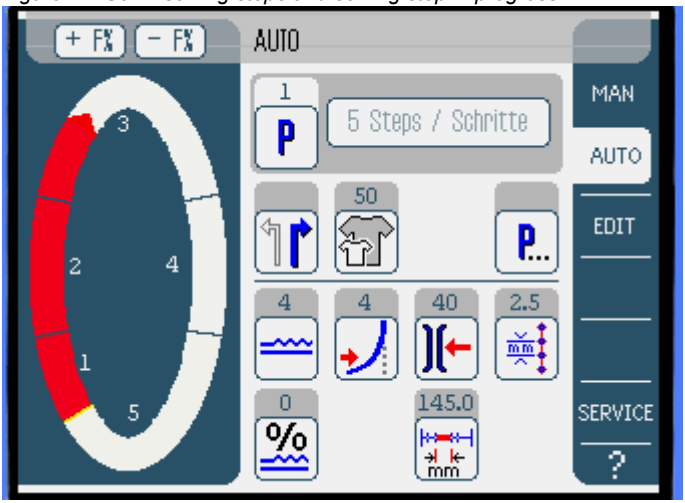
1. Select the seam program, 📖 page 100.

↳ The program number and name of the seam program are displayed on the user interface. If no name has been saved for the seam program, <No Name> is displayed.

2. Select the right or left piece to be sewn.
3. Select the size of the piece to be sewn, 📖 page 101.
4. Push the pedal forwards and sew the seam.

↳ The sewing progress is displayed graphically in the left pane as a red bar.

Figure 72: Sewn sewing steps and sewing step in progress



↳ The remaining sewing length per sewing step is displayed.

Changing parameters during the seam

1. Move the pedal to the **0 position**.
2. Change the desired parameter on the control panel.
3. Push the pedal forwards and sew.

↳ The seam will be sewn using the altered parameter value.

Correcting the fullness before or during the seam

1. Move the pedal to the **0 position**.
2. Change the fullness correction using the buttons **+ F%** or **- F%**.
3. Push the pedal forwards and sew.

↳ The changed fullness value is applied and displayed.

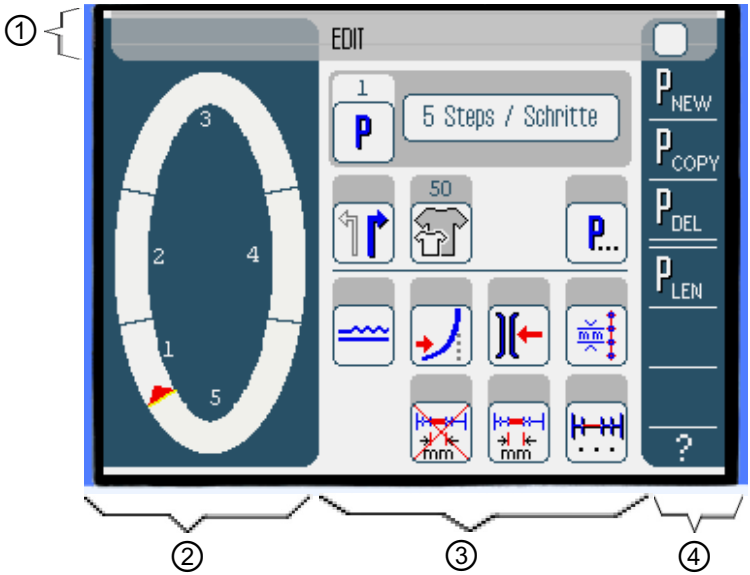
Cancel the seam program

1. Push the pedal fully back.

↳ The seam program is canceled.

8.7 Programming mode

Figure 73: Programming mode



Header (1)

The **EDIT** operating mode is displayed.

Left pane (2)

The graphical representation of the entire seam, divided into the number of programmed sewing steps, is displayed here.

Middle pane (3)

Existing seam programs can be edited here 📖 page 108. The number and the name of the selected seam program are displayed, together with the symbols for all the parameters that can be set. The gray fields above the parameter symbols show the respective current values.

Right pane (4)

Here new seam programs can be created 📖 page 113, existing seam programs can be deleted 📖 page 121, copied 📖 page 121 and optimized 📖 page 122 (Length Correction).

8.7.1 Editing existing programs (EDIT)

The following table lists the parameters that can be edited in **EDIT** programming mode.

Symbols	Meaning
	Changing the program name
	There is only one display in the **EDIT** mode. A new program is automatically assigned the next free program slot.
	Select the right or left piece to be sewn
	Set the sewing material size, 🕮 page 109
	Other program parameters in **EDIT** programming mode, 🕮 page 111
	Set the fullness in the current sewing step, 🕮 page 118
	Set the curve support in the current sewing step
	Set the needle thread tension in the current sewing step
	Set the stitch length in mm in the current sewing step
	Switch the seam length measurement in the current sewing step on or off
	Other sewing step parameters in **EDIT** programming mode, 🕮 page 112

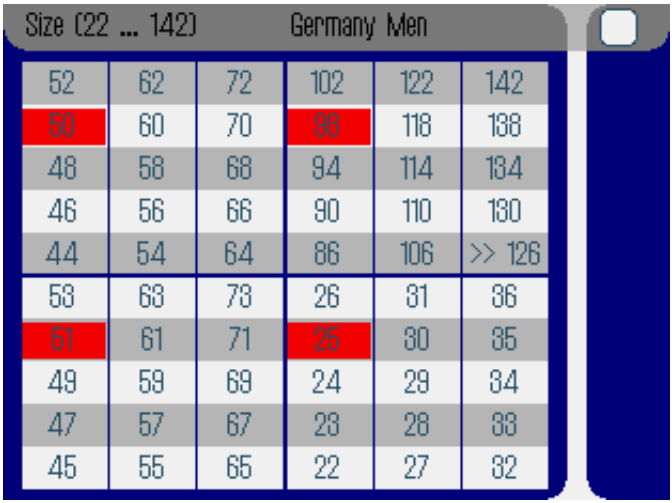
1. Press the desired button.

↳ The user interface for setting the desired parameter is displayed.

For some parameters the setting is more than just a numerical value. These extended parameters are described in detail below.

EDIT mode **Setting the sewing material size**

Figure 74: Setting the sewing material size parameter



The following information is displayed:

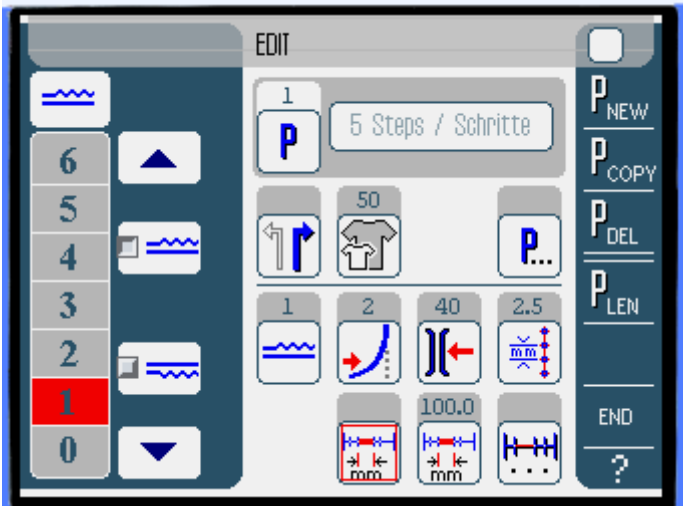
- The currently selected size is indicated by a double arrow (>>).
- The sizes highlighted in red represent the reference sizes for the graduation logic.

1. Press on the desired sewing material size.

↳ The **EDIT** user interface of the programming mode is displayed.

EDIT mode **Correcting the fullness in the current sewing step**

Figure 75: Correcting the fullness parameter



Buttons for manually inputting the fullness are displayed in the left pane.

Symbols/buttons	Meaning
	Input the fullness. The fullness setting is displayed by a button highlighted in red.
	Select the type of fullness: • Upper (upper transport) • Lower (lower transport) The fullness selected is displayed in an activated control field.
	Display of further buttons for inputting the fullness. The buttons 0 to 16 are available for input.

1. Select the type of fullness.

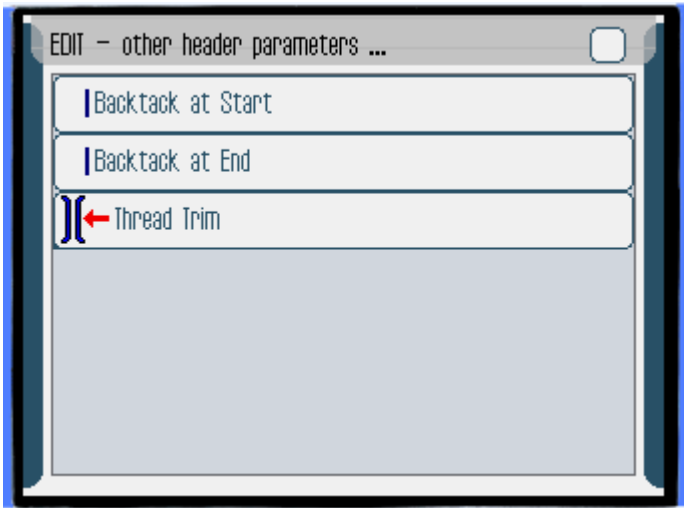
↳ The type of fullness selected is displayed in an activated control field within the symbol.

2. If a higher or lower degree of fullness is required, use the arrow keys to display more buttons.
3. Input the fullness using the buttons **0** to **16**.

EDIT mode **Other program parameters**

After the **Other program parameters** button has been pressed, an overview of all the available parameters is displayed.

Figure 76: Other program parameters in EDIT programming mode

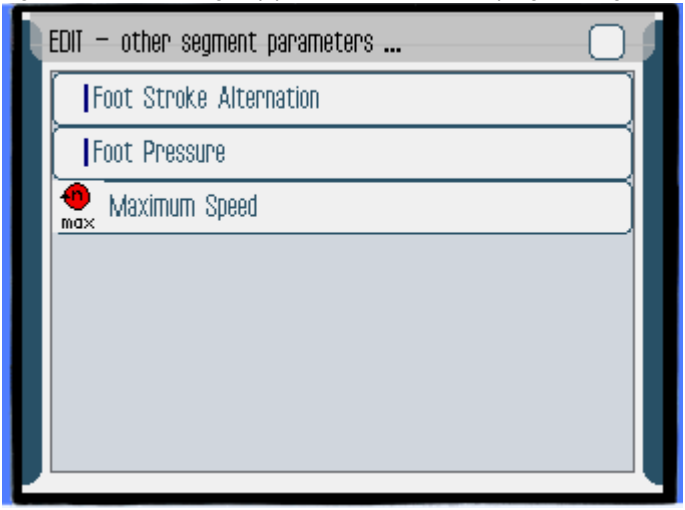


Parameters	Meaning
Backtack at Start	Backtack at start of the seam on/off Value range: 0, 1
Backtack at End	Backtack at end of the seam on/off Value range: 0, 1
Thread Trim	Thread cutoff on/off Value range: 0, 1

EDIT mode **Other sewing step parameters**

After the **Other sewing step parameters** button has been pressed, an overview of all the available parameters is displayed.

Figure 77: Other sewing step parameters in the EDIT programming mode



Parameters	Meaning
Foot Stroke Alternation	Presser foot alternation whilst the needle is in the seam. Value range: 0 ... 2.5 mm
Foot Pressure	Presser foot pressure. Value range: 1 ... 10
Maximum Speed	Sewing speed/rotational speed. Value range: 100 ... 4000

8.7.2 Creating a new program (PROGRAMMING)

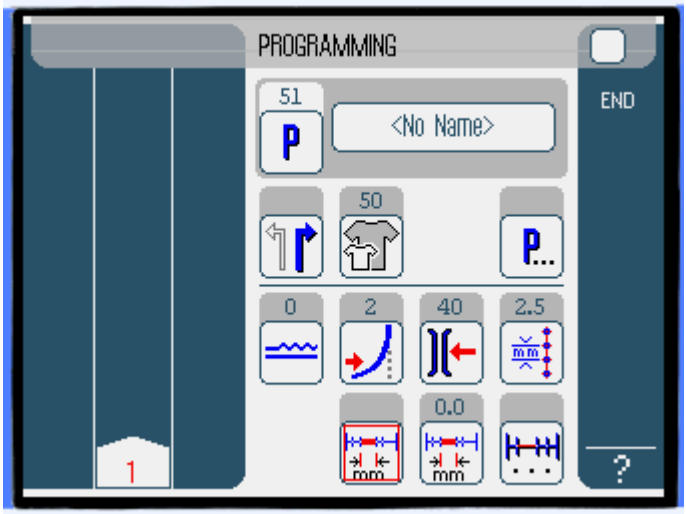
Prerequisite:

- Operating mode **EDIT** is displayed.

1. Press the **P$_{NEW}$** button.

↳ The **PROGRAMMING** user interface is displayed. Pressing the **P** button displays the number of the next free program slot.

Figure 78: Programming mode PROGRAMMING



2. Press **<No Name>** and input a name.

   Information for inputting text: 📖 page 91.

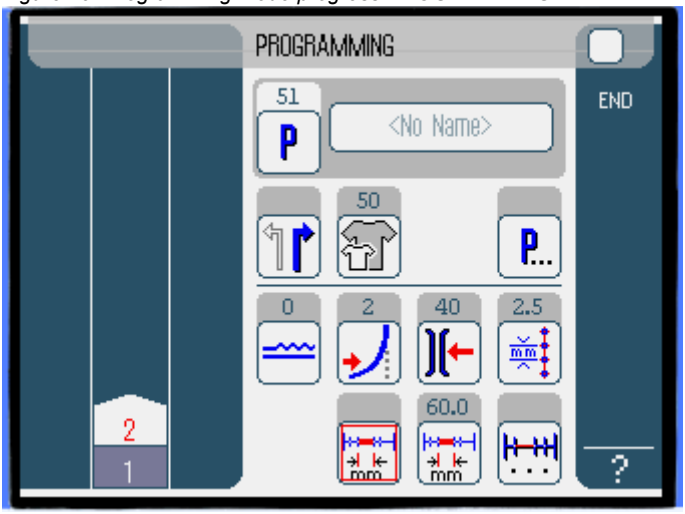
If no name is input for the seam program, <No Name> continues to be displayed.

↳ The first sewing step is displayed with its number in the left pane.

3. Input all the parameters for the first sewing step.
4. Sew the first sewing step, or manually input the length of the sewing step using the seam length measurement parameter.
5. Select the next sewing step, either by pressing on the number of the first sewing steps or by using the knee switch.

↳ The second sewing step is displayed with its number in the left pane.

Figure 79: Programming mode progress PROGRAMMING



6. Repeat step 2 until all the sewing steps have been programmed.
7. Press the **END** button or cut off the threads.

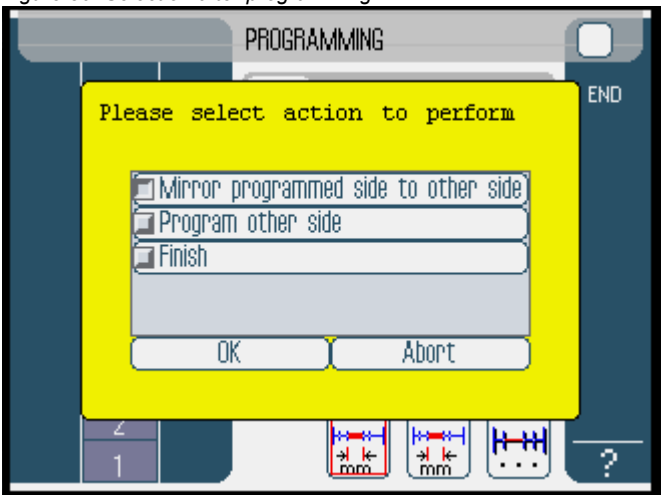
↳ There are three variants for the program response - depending on the user's input method:

Variant	Program display
The last programmed sewing step was sewn but not cut off, then ended with **END**.	continue with step 8
The last programmed sewing step was sewn and threads cut off.	continue with step 9
All sewing steps were input manually and ended with **END**.	continue with step 9

8. If the threads were not cut off after sewing, a message appears. Cut off the threads.

↳ The message is cleared.

Figure 80: Selection after programming



9. Select whether the new seam program should be mirrored for the other side of the sewing material (mirror programmed side to other side), the other side of the sewing material should be programmed (program other side) or the programming should be ended (finish).
10. Select the desired function.

↳ The selected function is indicated by an activated control field.

11. Press the **OK** button.

↳ The seam program is saved. Depending on which function is selected, different buttons are displayed:

Function	Button
Mirror programmed side to other side	AUTO mode
Program other side	PROGRAMMING-mode
Finish	AUTO mode

↳ Pressing the **Abort** button closes the window, the **AUTO** user interface is then displayed. All the data that were input are deleted by this!

Parameters that can be set

The following table describes the parameters that can be set in programming mode **PROGRAMMING**.

Symbols	Meaning
	Input the program name.
	There is only one display in the **PROGRAMMING** mode. A new program is automatically assigned the next free program slot.
	Select the right or left piece to be sewn
	Set the sewing material size, 📖 page 117
	Other program parameters in programming mode **PROGRAMMING,** 📖 page 119
	Set the fullness in the current sewing step, 📖 page 118
	Set the curve support in the current sewing step
	Set the needle thread tension in the current sewing step
	Set the stitch length in mm in the current sewing step
	Switch the seam length measurement in the current sewing step on or off
	Other sewing step parameters in programming mode **PROGRAMMING**, 📖 page 120

1. Press the desired button.

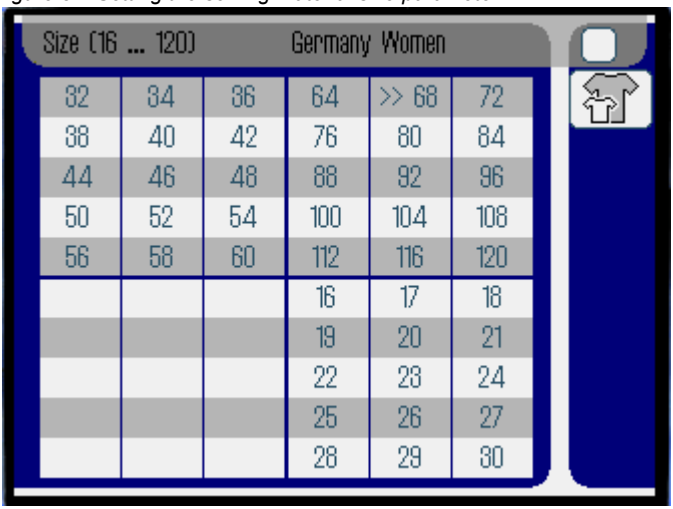
↳ The user interface for setting the desired parameter is displayed.

For some parameters the setting is more than just a numerical value. These extended parameters are described in detail below.

Mode PROGRAMMING

Setting the sewing material size

Figure 81: Setting the sewing material size parameter



The following information is displayed:

- The currently selected size is indicated by a double arrow (>>).

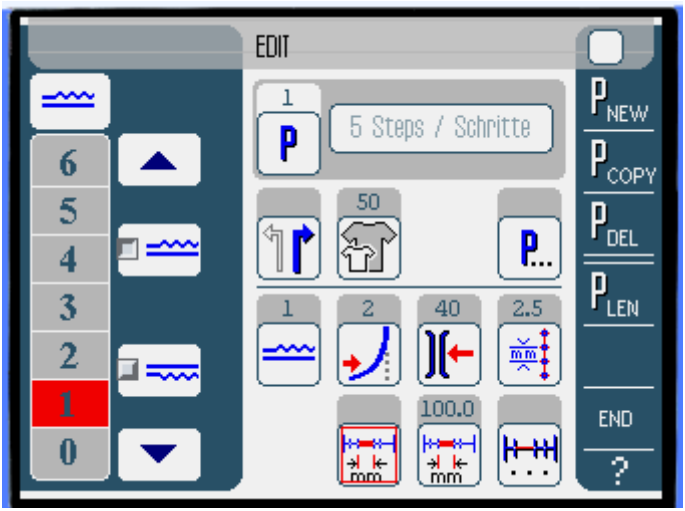
1. Select the size system in the right pane.
2. Press on the desired sewing material size.

↳ The **PROGRAMMING** user interface of the programming mode is displayed.

Mode
PROGRAMMING

Setting the fullness

Figure 82: Fullness setting parameter



Buttons for manually inputting the fullness are displayed in the left pane.

Symbols/buttons	Meaning
	Input the fullness. The fullness setting is displayed by a button highlighted in red.
	Select the type of fullness: • Upper (upper transport) • Lower (lower transport) The fullness selected is displayed in an activated control field.
	Display of further buttons for inputting the fullness. The buttons 0 to 16 are available for input.

1. Select the type of fullness.

↳ The type of fullness selected is displayed in an activated control field within the symbol.

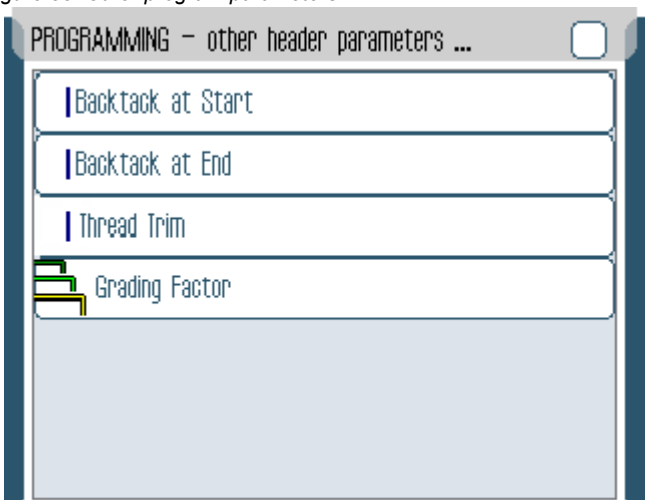
2. If a higher or lower degree of fullness is required, use the arrow keys to display more buttons.
3. Input the fullness using the buttons **0** to **16**.

Mode
PROGRAMMING

Other program parameters

After the **Other program parameters** button has been pressed, an overview of all the available parameters is displayed.

Figure 83: Other program parameters



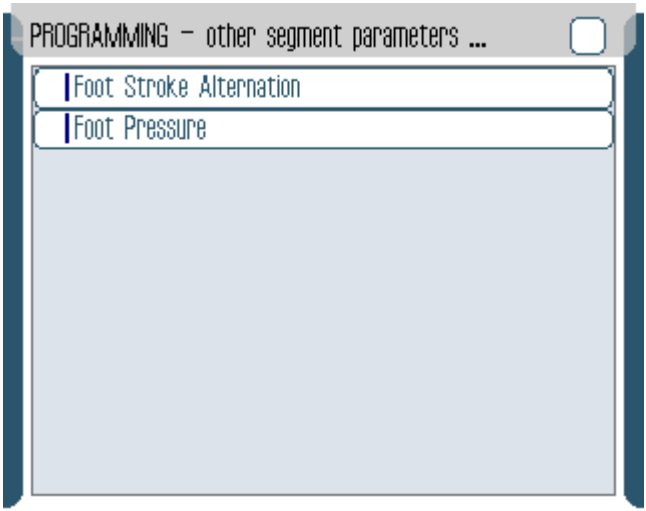
Parameters	Meaning
Backtack at Start	Backtack at start of the seam on/off Value range: 0, 1
Backtack at End	Backtack at end of the seam on/off Value range: 0, 1
Thread Trim	Thread cutoff on/off Value range: 0, 1
Grading Factor	Grading factor Value range: 0.0 ... 6.0 (% per size)

Mode
PROGRAMMING

Other sewing step parameters

After the **Other sewing step parameters** button has been pressed, an overview of all the available parameters is displayed.

Figure 84: Other sewing step parameters



Parameters	Meaning
Foot Stroke Alternation	Presser foot alternation whilst the needle is in the seam Value range: 0 ... 2.5 mm
Foot Pressure	Presser foot pressure Value range: 1 ... 10

8.7.3 Copying the seam program

Prerequisite:

- Operating mode **EDIT** is displayed.

1. Select the seam program, 📖 page 100.
2.

Press the **P_{COPY}** button.

↳ The seam program is copied and saved in the next free program slot. An appropriate message is displayed.

8.7.4 Deleting the seam program

Prerequisite:

- Operating mode **EDIT** is displayed.

1. Select the seam program, 📖 page 100.
2.

Press the **P_{DEL}** button.

↳ A message is displayed asking whether you really wish to delete the active seam program.

3. To delete the program, confirm by pressing the **Yes** button.

↳ The seam program is deleted. An appropriate message is displayed.

8.7.5 Length correction (LENGTH CORRECTION)

All the sewing steps are graded with the same factor.
In some sewing steps it is important for the quality of the result that the grading is greater or less than this.
You can use the length correction to achieve these local adjustments.

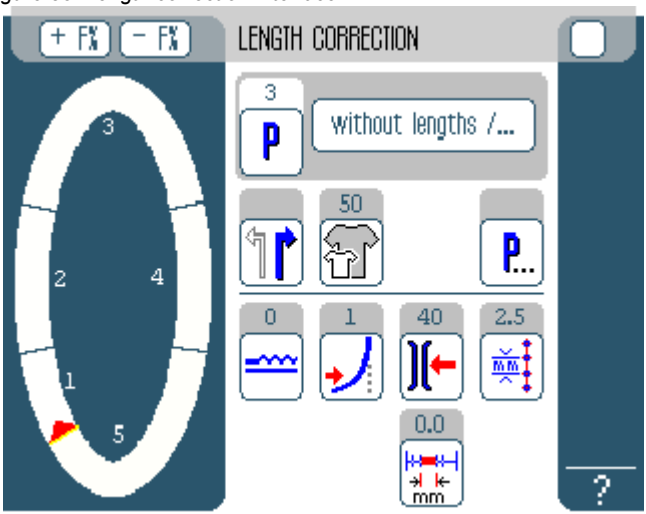
Prerequisite:

- Operating mode **EDIT** is displayed.

1. Press the **P_{LEN}** button.

↳ The length correction user interface is displayed.

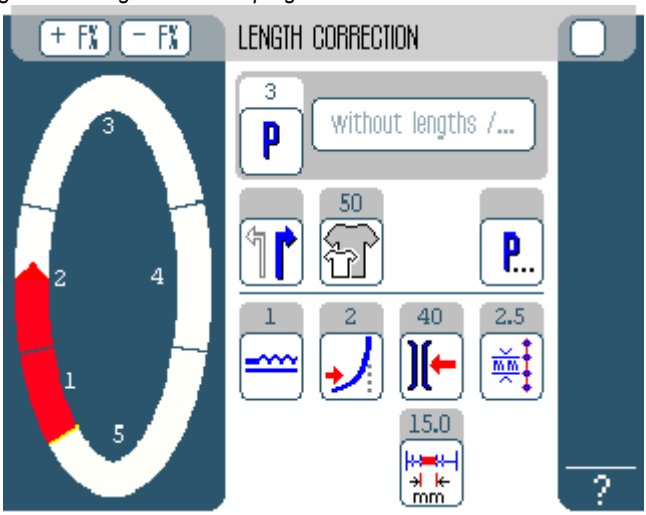
Figure 85: Length correction interface



2. Sew the sewing step.
3. Switch to the next sewing step either manually at the control panel or using the knee switch.

↳ The sewing progress is displayed graphically.

Figure 86: Length correction progress



4. Do the same with all further sewing steps.
5. After the last sewing step press the **END** button.

↳ This closes the length correction, **EDIT** programming mode then opens.

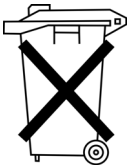
8.8 Service mode SERVICE

Service mode contains functions for use during service work.

Service mode is password-protected, to avoid accidentally changing the machine settings.

More information on the contents of Service mode can be found in the 🕮 *Service manual 650*.

9 Disposal



Do not dispose of the machine in the general household waste.

The machine must be disposed of in an appropriate and proper manner according to national regulations.

ATTENTION

Risk of environmental damage due to incorrect disposal!

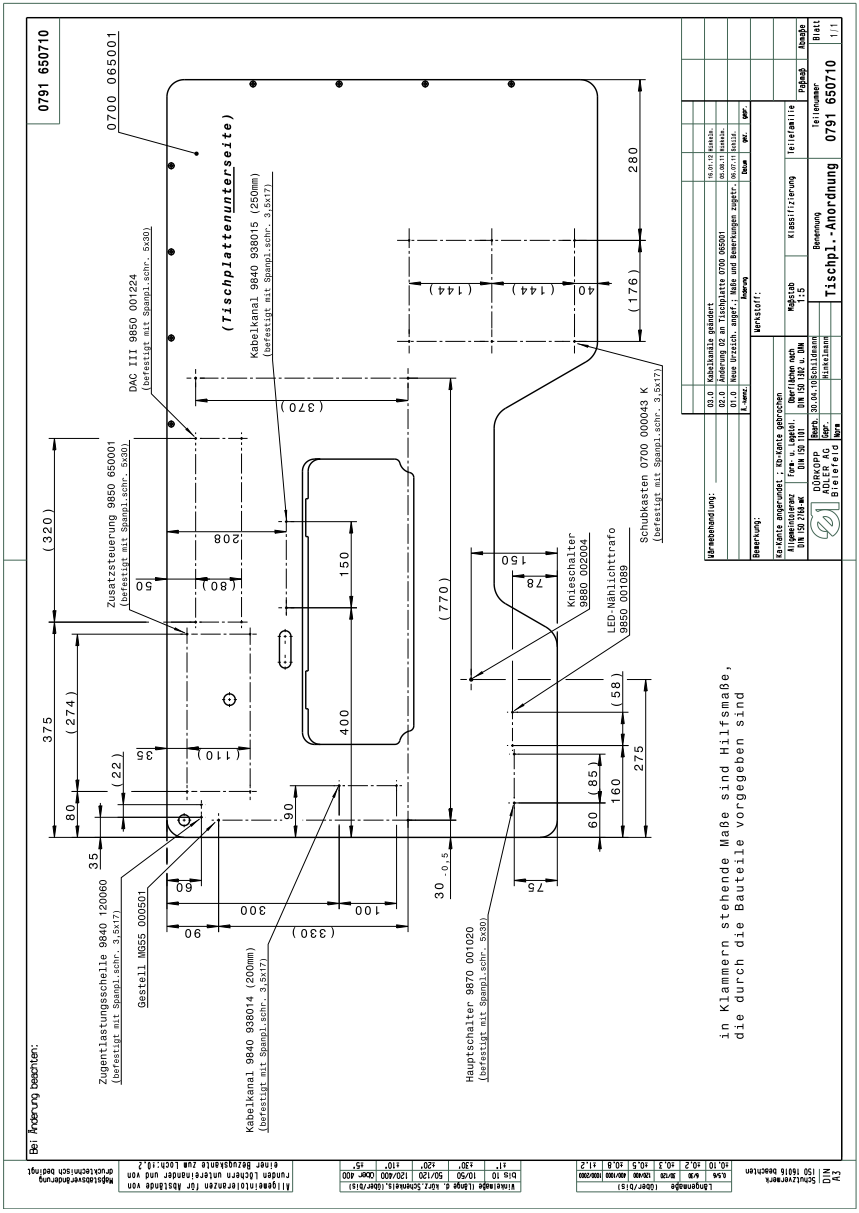
Improper disposal of the machine can result in serious environmental damage.

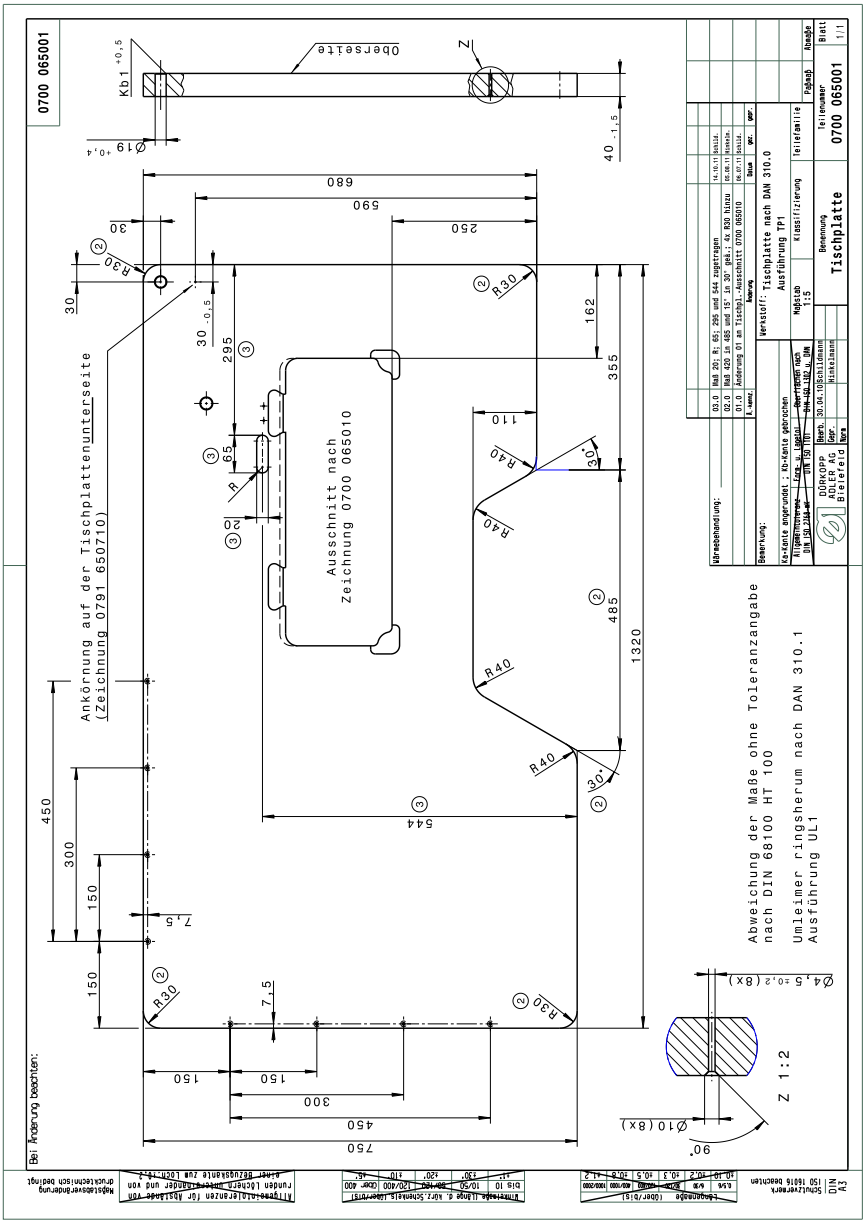
ALWAYS observe the legally prescribed regulations for disposal of oil.

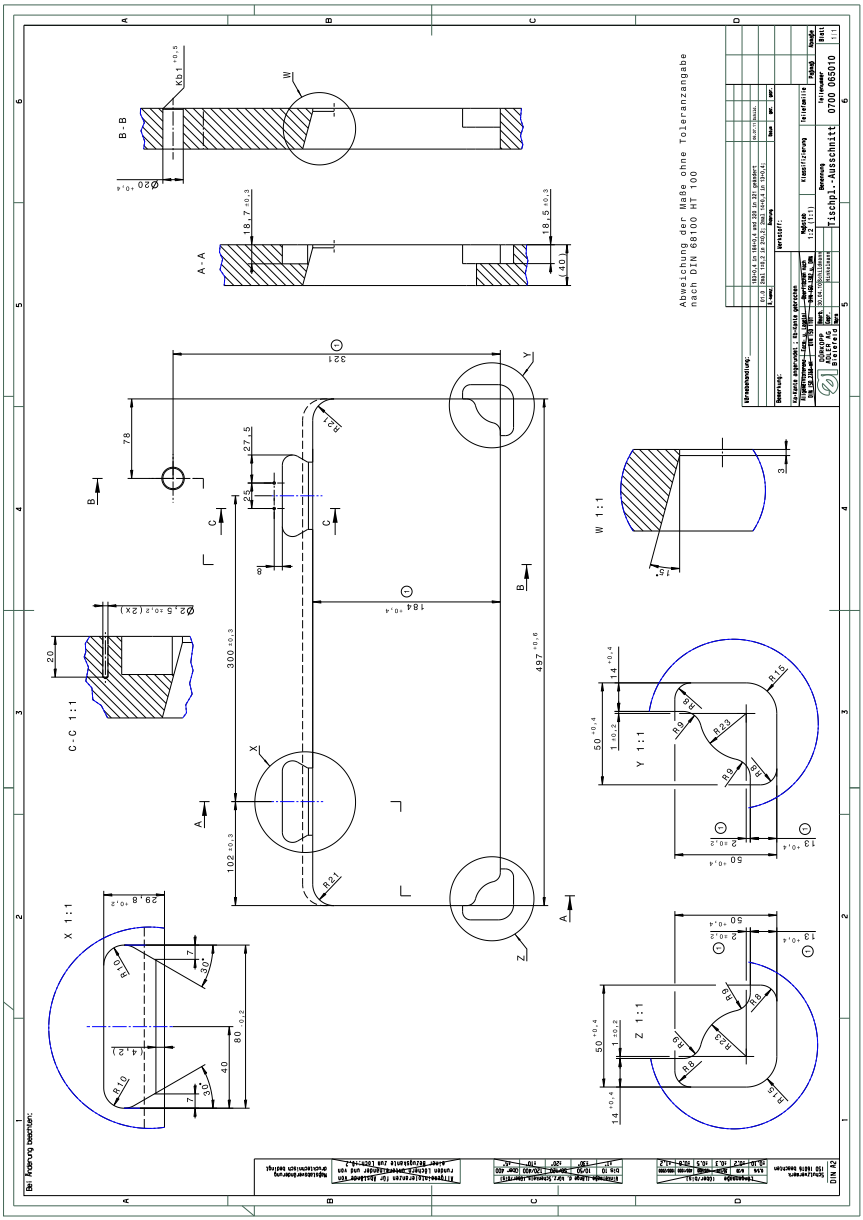
When disposing of the machine, be aware that it consists of a range of different materials (steel, plastic, electronic components, etc.). Observe the applicable national regulations for disposal.

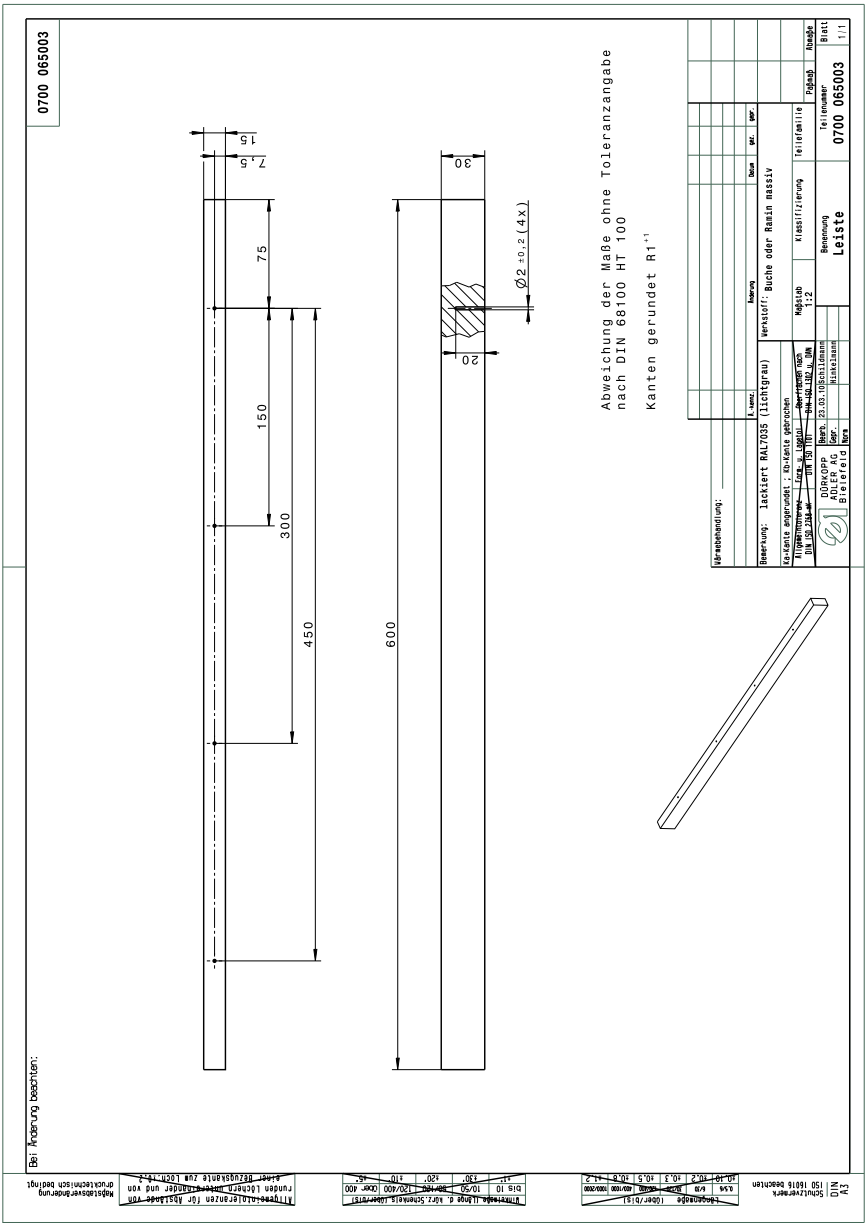
10 Appendix

Dimensions for manufacturing a table top




0700 065001
Oberseite
Kb 1 +0,5
Ø19 +0,4
Z
40 -1,5
680
590
250
30
R30
30
30 -0,5
295
162
355
485
1320
544
Ausschnitt nach
Zeichnung 0700 065010
Ankörnung auf der Tischplattenunterseite
(Zeichnung 0791 650710)
110
R40
30°
65
20
R
450
300
150
150
7,5
150
150
300
450
750
Ø4,5 ±0,2 (8x)
Ø10 (8x)
90°
Z 1:2
Abweichung der Maße ohne Toleranzangabe
nach DIN 68100 HT 100
Umleimer ringsherum nach DAN 310.1
Ausführung UL1
Bei Änderung beachten:
Wärmebehandlung:
Bearbeitung:
Kanten angerundet, Ab-Kante gebrochen
Werkstoff: Tischplatte nach DAN 310.0
Ausführung TP1
Maßstab 1:5
Klassifizierung
Teilefamilie
Bezeichnung
Tischplatte
Teilenummer
0700 065001
Blatt
1/1
DÜRKOPP ADLER AG
Bielefeld
Bearb. 30.04.10 Schillmann
Gepr.
Norm
Blankemann
Datum
Änd.-Nr.
Name
Änderung
03.0 Nut 20: B: 65: 295 und 544 zugetragen
02.0 Nut 420 in 485 und 15° in 30° gek.; 470 800 hinzu
01.0 Änderung 01 am Tischplattenschnitt 0700 065010
Schulterwerk DIN ISO 1803 beachten
Toleranzmaße (oberes/unteres)
Mittlere Maße für Schnitte über/bis
Maßtoleranzen für Abstände von Bohrungsmitten und Rändern und von Bohrungsmitten zum Rand
Maßabweichungen durch Oberflächenbeschaffenheit


Abweichung der Maße ohne Toleranzangabe
nach DIN 68100 HT 100
Tischpl.-Ausschnitt
0700 065010
B - B
A - A
W 1:1
Y 1:1
Z 1:1
X 1:1
C - C 1:1


0700 065003
Abweichung der Maße ohne Toleranzangabe nach DIN 68100 HT 100
Kanten gerundet R1+1
Ø2 ±0,2 (4x)
7,5
15
75
150
300
450
600
20
30
Bei Änderung beachten:
Oberflächenrauheit (Ober/Unt)
Maßtoleranzen für Abstände von Bohrungen und Nuten (Ober/Unt)
Maßtoleranzen für Abstände von Bohrungen und Nuten
Werkstoff: Buche oder Rahm massiv
Bemerkung
Bezeichnung
Leiste
Teilefamilie
Klassifizierung
Maßstab 1:2
Datum
Name
Gepr.
Norm
Benennung
Zeichnungsnr.
0700 065003
Blatt 1/1
DÜRKOPP ADLER AG Bielefeld
Kanten gebrochen
Kanten gerundet
Oberflächenbehandlung:
Lackierung
Änderung
Ersatz für:
Ersatz durch:
Ersetzt durch:
Ersetzt durch:
Ersetzt

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